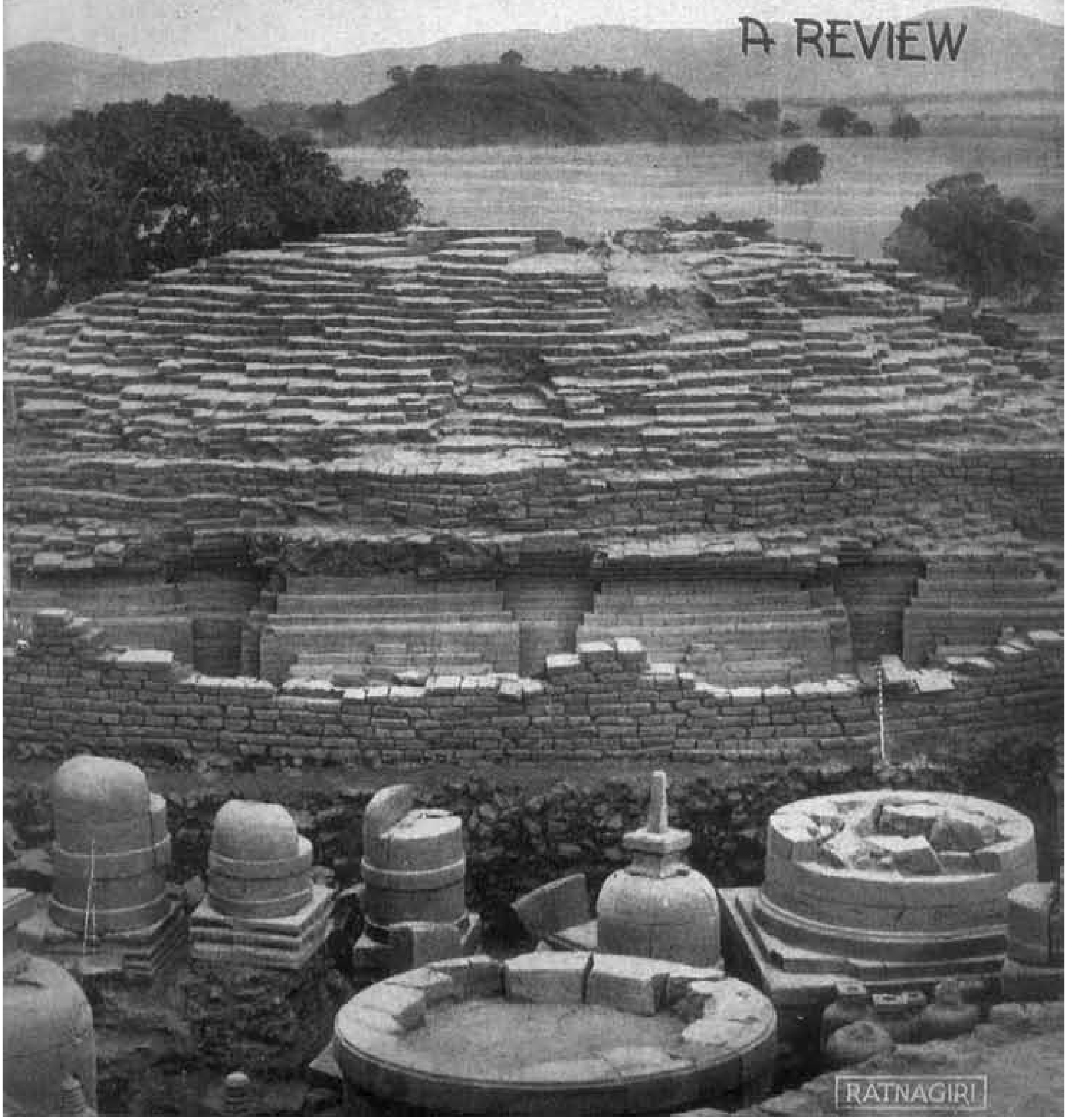
Indian Archaeology 1957-58

A REVIEW



INDIAN ARCHAEOLOGY 1957-58

—A REVIEW

EDITED BY

A. GHOSH

Director General of Archaeology in India

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As in the . four previous numbers of this annual *Review,* this being the fifth one in the Series, all the information and illustrations contained in the following pages have been received from different sources, viz. the officers of the Department of Archaeology of the Government of India and the heads of other institutions connected with the archaeological activities in the country, but for whose ready co-operation it would have been impossible to give the *Review* any semblance of completeness. To all of them, my grateful thanks are due. J also acknowledge the valuable help received from my colleagues in the Department in editing the *Reveiew* and seeing it through the Press.

In a co-operative endeavour of this nature, it is impossible for the editor or anybody else to assume full responsibility for the absolute accuracy of all the information and particularly for the interpretation of the archaeological material brought to light. Further, the possibility of editorial slips having crept in may not also be entirely ruled out, though it has been our best endeavour to avoid them.

NEW DELHI :
The 21st August 1958

A. GHOSH
Director General of Archaeology in India

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INDIAN ARCHAEOLOGY 1957-58

—A REVIEW

I. GENERAL

A RCHAEOLOGICAL exploration continued in full swing throughout the country during the year under review.

A survey of some of the river-valleys in the Vindhyan plateau brought to light sites with palaeolithic tools of Series I and II. Tools of Series II were also found at many a site in Saurashtra, the Deccan and northern Orissa, some parts of the last-mentioned region being already well-known for tools of Series I. The industries of the two Series, with their stations spread throughout the central highland and the Deccan, seem to conform, typologically, to comparable patterns, and a close study, with the objective of possible correlations, of the geological contexts to which they were affiliated and an intensive search for fossil-remains that their horizons may contain may go a long way towards establishing a chronological table showing the time-lag *inter se* at the stations where they co-occur and the geological relationship among the sites where they appear individually.

The limestone caves in the Kurnool region, wherefrom, as early as 1882, human fossil-remains had been reported, were re-examined. The results were negative in character in that no fossils were found in the exploration, though the existence of palaeoliths was noted in the valley' of a neighbouring stream.

A joint expedition, in which the Department of Archaeology, Geological Survey of India, Deccan College Post-graduate and Research Institute and Maharaja Sayajirao University of Baroda collaborated, explored the valley of the Banganga in Panjab, primarily to correlate the implementiferous terraces with the glacial and inter-glacial epochs. The data obtained in the expedition will now be utilized in examining the upper reaches of the river-system and in comparing the glacial oscillations here with those in the Kashmir valley.

The palaeolithic industry of the Bombay region was noticed, for the first time, to have been associated with river-terraces; the possibility of linking the terraces at some places with the ancient sea-levels was also noticed.

* * * * *

The spread of the Harappa culture in western India assumed new significance by the discovery of a station of that culture on the west coast even lower than the Narmada estuary. Exploration in Saurashtra brought to light more Harappan and late Harappan sites.

As a result of continued excavation at Lothal, an already-reputed Harappan settlement, it was noticed that, though the place was far removed from the Indus cities, its inhabitants followed the same traditions of town-planning and public hygiene for which the Harappans are famous.

Navdatoli, a single-culture chalcolithic site in Malwa, was subjected to an extensive horizontal excavation, whereby was gathered valuable evidence about contemporary domestic architecture, ceramics and artefacts.

Renewed exploration in Rajasthan indicated the wide spread of microliths and the black-and-red ware, found either independently or in association with each other. A link between the archaeology of Rajasthan and that of the Ganga valley was provided by the occurrence at one of the sites of the early historical pottery similar to that met with at Hastinapura.

Further excavation at Ujjain in Malwa, one of the largest early cities of India, revealed *inter alia* the ancient industries of the place and the nature of its defences, in the core of which timber had been employed as reinforcement on the riverside.

In the Chambal valley, also in Malwa, were discovered a few rock-shelters with paintings, apparently comparable with those occurring elsewhere in the Vindhya and Satpura ranges, and a few microlithic and later sites.

* * * * *

Of the sites in the Ganga plains, Kausambi had to its credit a brick wall, upwards of 40 ft. in extant height, as a part of its defensive system, the loftiest wall as yet found at any excavated site in India, and the remains of an ancient ritual. At Vaisali was excavated a *stupa* which had its origin in pre-Mauryan times and may have been, according to the excavator, one of the eight traditional *stupas* built over the relics of Buddha immediately after his death. Rajghat, the site of ancient Varanasi, yielded remains dating from the period of the Northern Black Polished Ware down to medieval times. Chandraketugarh, not far from Calcutta, contained remains of the Mauryan and later periods, a notable discovery being that of an elaborately-planned temple dating from Gupta times.

At Ter, in the Deccan, were found relics of the early historical period, including the Northern Black Polished Ware.

The medieval remains of Delhi, partly antedating the Muslim occupation of the city, were tapped at a few places, which, even in their limitedness, showed interesting facts about town-planning and fortifications.

* * * * *

Investigation on south Indian megaliths continued. Apart from isolated sites in Coimbatore and Madurai Districts, Kunnattur, near Madras, yielded further evidence on the diverse megalithic burial-practices and had, in addition, a habitation-site partly contemporary with the megaliths.

* * * *

GENERAL

It is now becoming increasingly evident that the ill-fated site of Nagarjunakonda,. till recently famous only on account of its Buddhist remains, is important for many additional reasons, inasmuch as it contains a continuous history of man in the region, beginning right with the Early Stone Age and ending only with medieval times, during which Vast span of time it passed through the palaeolithic, neolithic-*cum*-chalcolithic and megalithic, stages and the historical periods under the Satavahanas, Ikshvakus, Chalukyas and even later rulers. This year's excavation included neolithic and mega-lithic burial-sites and the defences, erected by the Ikshvakus around their citadel, not to mention religious edifices, Buddhist and Brahmanical, with which the valley is studded.

Opposite Nagarjunakonda, on the other bank of the Krishna, the site of Yelle-swaram yielded extensive ruins of medieval temples.

*   *   *   *   *

Excavation at Ratnagiri in Orissa brought to light the remains of an early medieval *stupa,* which, as far as evidence goes, had an earlier, Gupta, nucleus. The recovered sculptures may perhaps indicate that the Mahayana-Vajrayana development of the Buddhist pantheon took place, at least in this part of the country, somewhat earlier than is usually supposed.

*   *   *   *   *

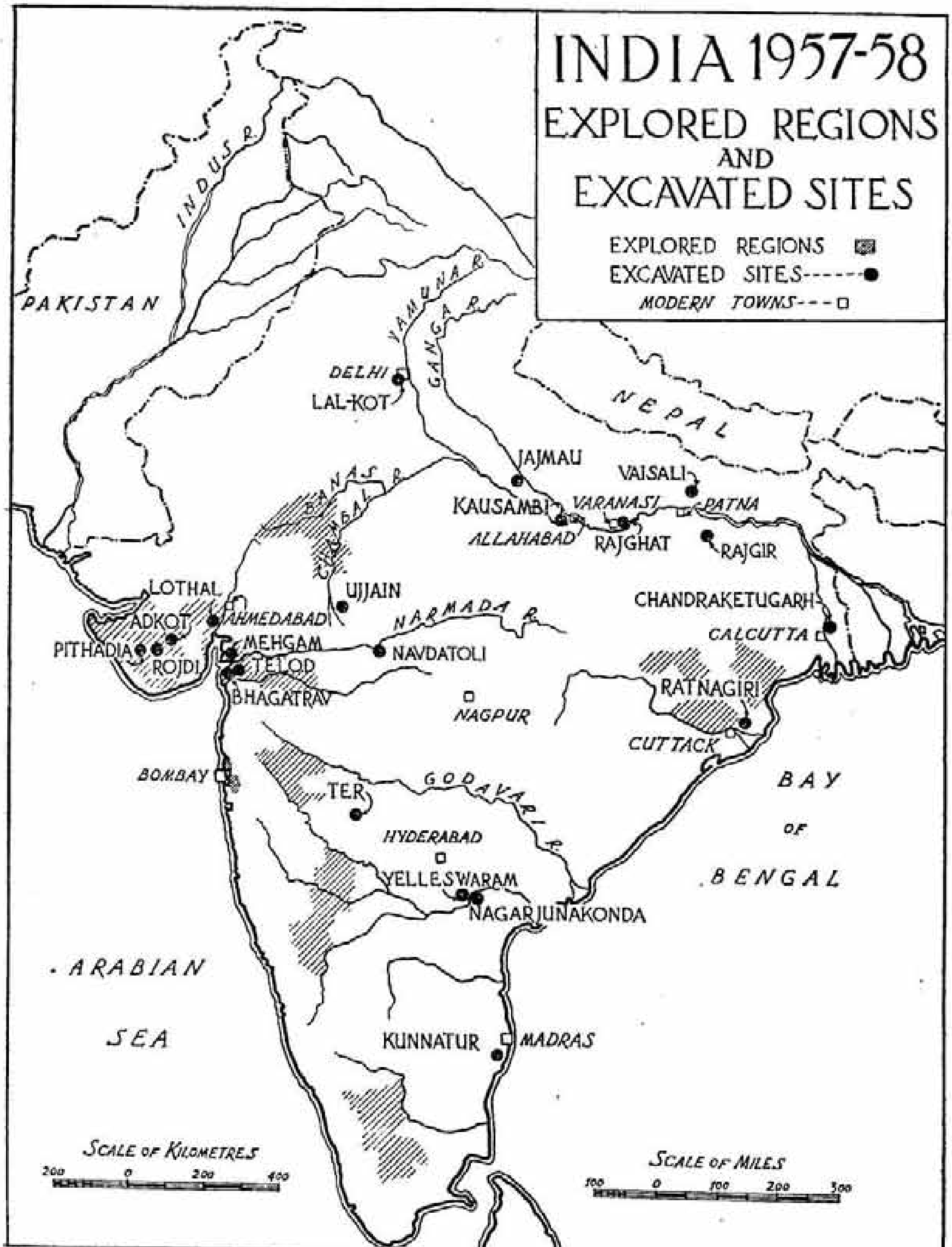
Amongst other discoveries, mention may be made of a few remarkable sculptures, discovered at the rock-cut caves at Pitalkhora, not far from Ajanta, which will henceforth occupy a prominent place in early plastic art. In addition, the year witnessed a very large number of other discoveries all over the country, ranging from the palaeolithic to fairly recent times and including epigraphical and numismatic ones.

The regional and chronological study of temple-architecture progressed apace.

*   *   *   *   *

Other archaeological activities continued in the normal way. A vast number of standing monuments received routine and special structural repairs. Particularly remarkable success was achieved in the repairs to the decayed parts of rock-cut monuments, specially at Ajanta and Ellora, by an appropriate use of suitably-tinted cement-concrete, reinforced where necessary, simulating the massive and homogeneous appearance of rock.

Many monuments and the paintings that some of them bear were chemically cleaned and conserved according to methods evolved by a study of local conditions and problems.



INDIA 1957-58
EXPLORED REGIONS
AND
EXCAVATED SITES
EXPLORED REGIONS
EXCAVATED SITES
MODERN TOWNS
PAKISTAN
INDUS R.
YAMUNA R.
GANGA R.
DELHI
LAL-KOT
NEPAL
JAJMAU
VAISALI
KAUSAMBI
VARANASI
PATNA
ALLAHABAD
RAJGHAT
RAJGIR
BANAS R.
CHAMBAL R.
LOTHAL
UJJAIN
CHANDRAKETUGARH
ADKOT
AHMEDABAD
NARMADA R.
CALCUTTA
PITHADIA
MEHGAM
ROJDI
TELOD
NAVDATOLI
BHAGATRAV
NAGPUR
RATNAGIRI
CUTTACK
BOMBAY
TER
GODAVARI R.
BAY
OF
BENGAL
HYDERABAD
YELLESWARAM
NAGARJUNAKONDA
ARABIAN
SEA
KUNNATUR
MADRAS
SCALE OF KILOMETRES
200
0
200
400
SCALE OF MILES
100
0
100
200
300

FIG. 1

II. EXPLORATIONS AND EXCAVATIONS[1]

ANDHRA PRADESH

1. EXCAVATION AT NAGARJUNAKONDA, DISTRICT GUNTUR.—In progress since 1954 *(Indian Archaeology 1954-55-A Review*[2], p. 22; *1955-56,* p. 23; *1956-57,* p. 35), the excavation was further extended during this year to cover an area of about 1200 acres, under Dr. R. Subrahmanyam, assisted by Shri K. K. Sinha, Shri M. D. Khare, Shri H. Sarkar, Shri Raghbir Singh and Shri Abdul Wahid Khan. The discoveries included palaeoliths, microliths, neoliths with associated graves, and megaliths, besides numerous structures of the early historical period. Of the last, the citadel, with its grand fortification-wall, ditch, gates and barracks, was indeed very important, as it threw light on the town-planning and flourishing condition of the capital of the Ikshvaku kings during the third century A.D. Another outstanding structure was a huge oblong stadium, laid out between the north-western corner of the citadel and the Pushpabhadrasvami temple at the foot of the Nagarjuna hill.

Six neolithic graves, located in the southern part of the valley, were exposed. Although lying extended, roughly in a north-south direction, the skeletons did not show proper articulation (fig. 2; pl. I A). Towards the feet were placed pots of wheel- as well as hand-made burnished grey ware (fig. 3), similar to those found last year in the neolithic habitation-area. Most of the vessels were spouted; the straight-sided bowl with featureless rim was also represented by small fragments. There were no other grave-goods.

Not far from the south-eastern corner of the citadel, where over a dozen megaliths had been previously discovered, a pit-circle (pl. I B), 24 ft. in diameter, was partly excavated. Its 8-ft. wide central pit, dug into the hard natural rock, yielded pottery and iron implements. Another small pit-circle, located in the southern zone of the valley,, yielded only animal-bones.

Enclosing a trapezoidal area, about 3000 x 2000 ft., the citadel-wall (fig. 4) ran along the right bank of the Krishna on the west at an average distance of 350 ft. from it, while on the south it overlay the summit of the 170-ft. high Peddakundellagutta hill, its maximum extant height on the plains being about 16 ft. above the outside ground-level. Trenches laid across the wall, both on the east and west (pl. II A), showed that it had been built in two phases : the first or lower phase was represented by a rampart of *morum* or mud, about 80 ft. wide at the base, resting on the natural soil, except on the western (river) side, where it overlay an earlier occupational deposit represented by a floor and a few hearths; the second phase was represented by a burnt-brick wall, 9 to 14 ft. thick, generally built either directly on the existing rampart or on a secondary filling over it, but on naturally high grounds directly on the bare rock-surface. Save for the portion overlying the Peddakundellagutta hill, the fortification-wall was surrounded by a ditch, 12 ft. in depth and varying from 74 to 132 ft. in width. Two main gateways, one each on the eastern and western sides, and a narrow postern gate, on the northern side (pl. II B), possibly serving as an emergency-exit, were exposed. Close to the eastern gateway were barracks including stables and a nicely-plastered masonry

[1] See fig. 1.

[2] This publication is referred to in the following pages by the year only.

cistern. The western gateway, with a minimum width of 17 ft., lay near the *asvamedha*-site excavated last year.

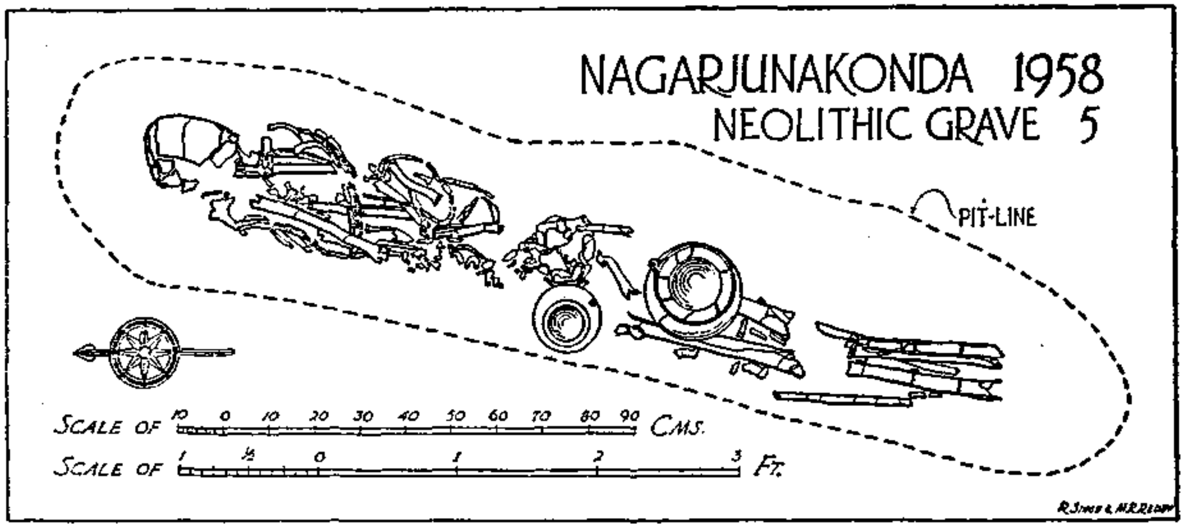


FIG. 2

The ceramic evidence from the pre- to post-rampart layers was essentially uniform, the pottery from both the groups of layers appertaining to the Ikshvaku period. Sections across both the western and eastern defences showed that most of the religious buildings outside the wall were comparatively late, having been built after the ditch had been filled to a height of about 8 ft. from the bottom by the debris of the brick fortification-wall of the second phase. One of these structures was a Buddhist *vihara,* located outside the eastern fortification-wall, where a stone image of Buddha, installed during the twentyfourth regnal year of the third Ikshvaku king Ehuvala Chamtamula, had been found last year. The post-rampart layers yielded coins of Virapurushadatta and Ehuvala Chamtamula, respectively the second and third Ikshvaku kings, along with the typical pottery and terracotta figurines of the period.

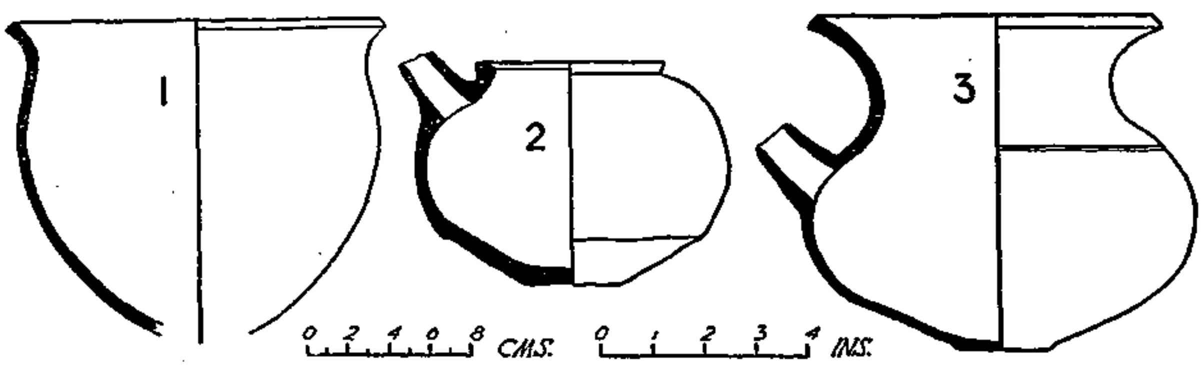


FIG. 3. *Nagarjunakonda: pottery from neolithic graves*

Oriented along the cardinal points, the stadium, referred to above (p. 5), consisted of a central arena, 309 ft. long, 259 ft. wide and 15 ft. deep, enclosed on all four sides by flights of steps with 2-ft. wide treads and having a pavilion on the west the all constructed of burnt bricks (pi. III). In continuation of the topmost steps, there

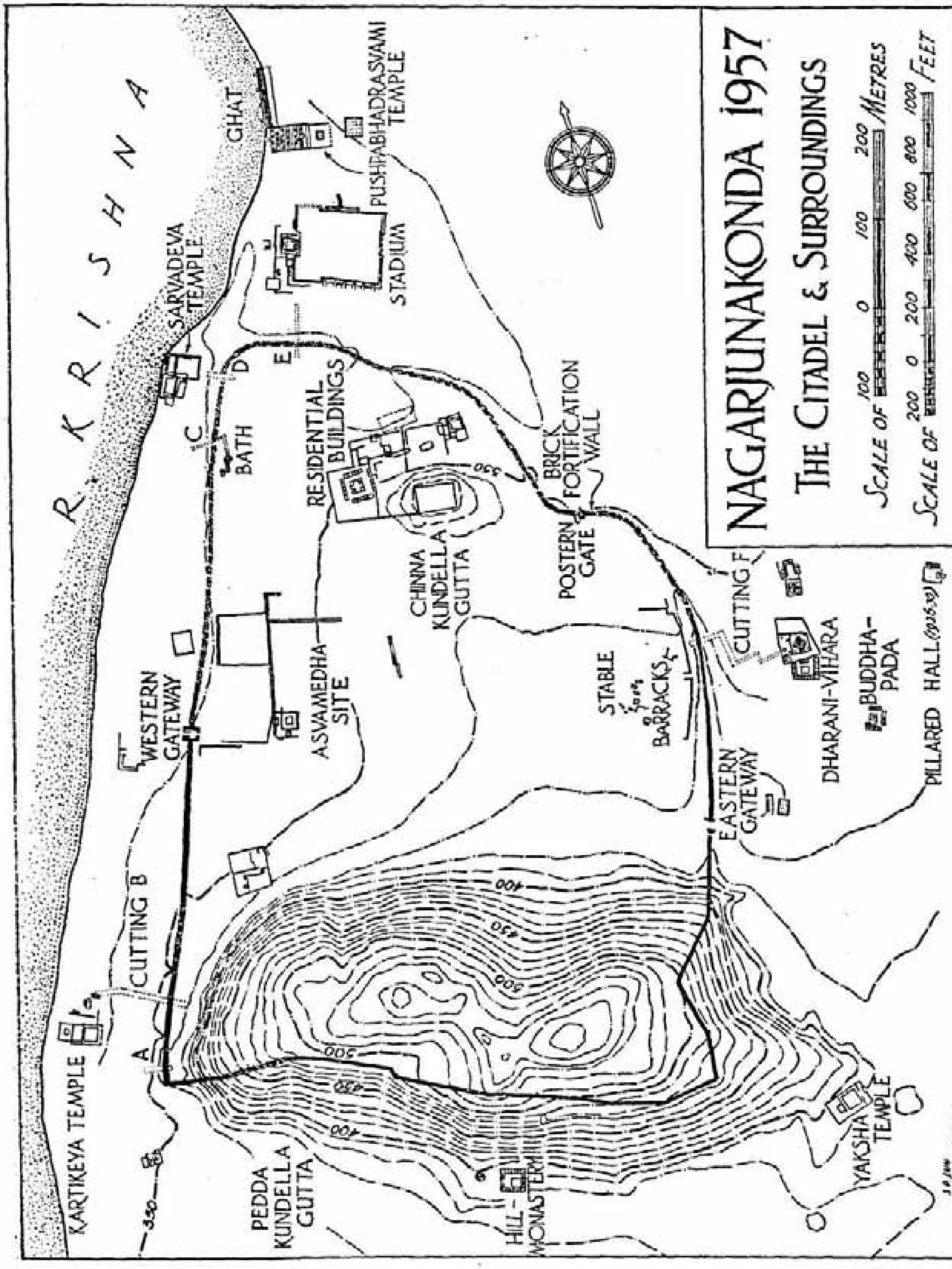

NAGARJUNAKONDA 1957
THE CITADEL & SURROUNDINGS
SCALE OF 100 0 100 200 METRES
SCALE OF 200 0 200 400 600 800 1000 FEET
K R I S H N A
KARTIKEYA TEMPLE
CUTTING B
A
C
D
E
WESTERN GATEWAY
BATH
SARVADEVA TEMPLE
GHAT
STADIUM
PUSHPABHADRASVAMI TEMPLE
RESIDENTIAL BUILDINGS
ASVAMEDHA SITE
CHINNA KUNDELLA GUTTA
BRICK FORTIFICATION WALL
POSTERN GATE
STABLE
BARRACKS
CUTTING F
EASTERN GATEWAY
DHARANI-VIHARA
BUDDHA-PADA
PILLARED HALL
PEDDA KUNDELLA GUTTA
HILL-MONASTERY
YAKSHA TEMPLE
330
350
400
450
500
550

FIG. 4

was a platform all round, the width of which, as noted on the southern side, was 11 ft. On this side six staircases, placed at regular intervals, each measuring 6 ft. in width, connected the arena with the platform. They were strengthened by wooden or stone nosings, for the fitting of which slits were provided on each side in the structure. Both treads and risers of the staircases were smaller than those of the steps that ran around the stadium, indicating that while the former served as passages the latter were evidently meant for sitting. The pavilion, at the middle of the western side, showed three distinct phases. Square or oblong holes in the floors of the first and second phases suggested the use of pillars for holding the roof, of which tiles and finials were found all over the area. The dimensions of the pavilions of the three phases, beginning from the earliest, were respectively 84 x 39 ft., 69 x 33 ft. and 50 x 44 ft. Associated with the latest pavilion was an enclosure-wall, with an entrance on the west. The debris of the structures of the third phase was covered with a 9-ft. thick layer of dark silt, which was disturbed and finally sealed by a 10- to 12-ft. thick deposit of sand. A 2-ft. wide drain (pl. IV A) passing through the northern wall of the stadium, cleared out the rain-water from the arena.

The southern zone of the valley, along the right bank of the river, revealed a large number of religious and secular structures. Of these, the most interesting was a complex lying within a brick enclosure, 200 x 150 ft., and comprising a pillared hall, four square and two octagonal platforms and two apsidal shrines. It had also an extension on the south in the form of a four-winged dormitory (pl. IV B). Some of the best specimens of sculptures, depicting *mithunas,* bulls, scorpions, wrestlers, *purna-kumbhas,* etc., all ascribable to the Ikshvaku period, were recovered from this site.

Close to the above complex was a three-winged monastery with a drain, a bath and a privy in one corner.

Another octagonal shrine in the same vicinity, built of re-used bricks and enclosed within a random-rubble wall, may be noted. No antiquities were found here, but the associated pottery could be assigned to the last phases of the Ikshvaku or even later period. Nearby were several pits which yielded animal-remains, terracotta and glass beads, querns, pestles and dull-grey pottery, the last being ascribable to the early medieval times.

Further to the east was a stepped brick tank with an attached residential structure. Here two phases of occupation were exposed along the river near the Putlagudem village. Each unit had three rooms with a common verandah in front, a lay-out common at Nagarjunakonda and in the Satavahana levels at Brahmapuri and Kolhapur.

Not far from the pit-area referred to above was an early medieval Siva shrine made of bricks veneered with slabs and having paved floors and neatly-plastered walls. It had a tiled roof resting probably on four wooden pillars. Particular interest attached to a small ablution-tank connected with the cells by a drain. A number of stone *lingas* were found inside the temple.

About 50 ft. west of this shrine was an oblong brick structure enclosed by a massive rubble wall, the overall measurements being 250-x 150 ft. Adjacent to it was another complex, in which a raised *mandapa-like* structure was conspicuous by the use of wooden pillars.

The most elaborate amongst the Buddhist religious structures was a monastic complex belonging to the Aparamahavinaseliya sect, as mentioned in a pillar-inscription dated in the eighth regnal year of Ehuvala Chamtamula. Situated on a rocky

outcrop, about 300 yards to the east of the citadel, the complex consisted of a *stupa,* 42 ft. in diameter, a pillared hall surrounded on the three sides by a three-winged *vihara,* a *stupa-chaitya* with two votive *stupas* and an enclosed *Buddha-chaitya* with a mutilated figure of Buddha inside it. The *stupa* was enclosed by a wall, with an entrance on the east. In the low-lying tract contiguous to the *stupa* area was revealed a network of rubble-built residential structures.

In the monastic area, an isolated brick drain, running for 48 ft. from east to west, was excavated. It took off from a brick platform, 10 ft. 6 in. x 5 ft. 4 in., overlain by a thick rubble wall, the latter serving as a bund against the water coming from the nearby hills during the rains. This was evidently designed to divert water from the important structures in the low-lying area.

A *mandapa,* supported by fortyeight limestone columns, was partly excavated on the right bank of the Krishna, just at the foot of the Nagarjuna hill and north of the citadel. The floor of the *mandapa* was paved with stone slabs, while a stone bench abutting a plastered wall ran thoughout its length.

The pottery from these areas belonged mostly to the Ikshvaku period and included the black polished, black-slipped, red-slipped and black-and-red wares. Particular mention may be made of the sprinklers and handles of the Roman amphorae, the latter in a very restricted number. Most of the pottery-types, except the late ones, were analogous to those from Arikamedu, Brahmagiri, Chandravalli and Sisupalgarh.

The other antiquities included terracottas, beads of various materials, objects of iron copper and shell, glass bangles, stucco fragments, inscribed material, coins (pl. V), etc. The sculptural material consisted of bas-relief carvings and images in the round (pls. VI and VII). The most representative specimens of the former category were medallions and other fragments of the railings depicting *mithuna-figures,* dancing dwarfs, wrestling scenes, *dvara-palas,* war-scenes, *purna-kumbhas* and animals. The outstanding specimens of the latter category included images of Buddha and Karttikeya and a more-than-life-size figure of a *yaksha.*

In addition to the lead coins of the first three Ikshvaku kings, a few specimens of seals, sealings and clay bullae, the latter depicting the trident and a human head, possibly copied from a Roman coin, were noteworthy.

2. EXPLORATION IN DISTRICT KURNOOL.—The Prehistory Branch of the Department, under Shri K. V. Soundara Rajan and Dr. R. V. Joshi, carried out a brief season's exploration of all the important caves, mentioned by Cammiade, in the limestone formations near Kurnool, but did not find in them any Stone Age artefacts or fossils, although one of the caves, viz. Billa Surgam, had yielded, to Bruce Foote, Pleistocene mammalian fossil-remnants. Even a trial-excavation of one of the caves, Kishnamakona-gavi, did not throw up any culture-debris. However, in a neighbouring area, in the Galaru valley, lying between Nandyal and Atmakuru, a rich Lower Palaeolithic industry on quartzite, comprising Abbevilleo-Acheuliari bifaces and plain-platform flake-tools, was recorded.

3. EXCAVATION AT YELLESWARAM, DISTRICT NALGONDA.—When the Nagarjunasagar dam on the Krishna is completed, the site of Yelleswaram, like Nagarjunakonda on the other side of the river, will get submerged under water. With a view to salvaging as much as possible of the ancient remains, the Department of Archaeology, Government of Andhra Pradesh, under Dr. P. Sreenivasachar, undertook excavations

in the Yellaisvaramsvami temple-area, Chandaryya field and at Kistnapuram. To enable an ultimate co-ordination with Nagarjunakonda, the area was divided into sectors on the lines followed at the site.

In the temple-area, beneath the ruins of the medieval temples and other build ings, were brought to light numerous brick structures, some with apsidal ends, ascribable to the Buddhistic period. The pottery was closely analogous to that from other Buddhistic sites in Nalgonda District and elsewhere in Telangana. The other antiquities, numbering over six hundred, included coins, beads, terracotta figurines, metal objects, etc.

In the Chandrayya field were found crude furnaces and iron slag in abundance which threw valuable light on ancient metal-working.

At Kistnapuram, a few stone-circles were excavated.

A general survey of the entire area also brought to light microliths and polished stone axes, besides several inscriptions assignable from the Chalukyan period down to the thirteenth century A.D.

BIHAR

4. EXCAVATION AT VAISALI, DISTRICT MUZAFFARPUR.—The K. P. Jayaswal Research Institute, under Dr. A. S. Altekar, conducted excavation at two sites, the periphery of an ancient tank and a *stupa,* both about half-a-mile to the north-west of the ruins of the fortified city of Vaisali, now known as Raja-Visal-ka-garh.

The first site, that of the tank, now called Kharauna-pokhra, with a length of 1420 ft. and width of 660 ft., is locally believed to represent the ancient *abhisheka-pushkarini* of the Lichchhavis, in which none but the Lichchhavi chiefs was allowed to bathe. Several trenches were laid all round the tank to find out whether it had been anciently surrounded by any wall. It was established by excavation that while no wall existed at the top of the tank-embankment, there had been one, 3 ft. 4 in. wide, along its slope, very near the present-day water-level during the month of March. Its foundation, with one or two brick-courses, could be followed over a stretch of 72 ft. on the south, but it was found to be best preserved on the north-east, where it was traced over a length of 95 ft., up to seven to thirteen courses in height (pl. VIII A). The meeting points of the southern, eastern and western sides of the wall were also located. The use of bricks of a uniform size (15 x 9 x 2 in.) throughout showed that the wall had been built in one operation.

Near the centre of the southern embankment was found a concrete platform, 2 ft. below the foundation-level of the wall, and hence antedating it. The antiquites in the intervening deposit and in the layers underlying the spoil-earth of the tank deposited on its embankment included cast coins and terracotta figurines stylistically assignable to the Sunga age, which were indicative of the date of the wall. The original tank of the Lichchhavis might have been a smaller one, which was subsequently enlarged and surrounded by a wall, represented by its present remains, in about the second century B.C., when the Lichchhavis might have once more become powerful after the downfall of the Maurya empire.

(The accounts of Hiuen Tsang indicate that during his time the Buddhists of Vaisali believed that the *stupa* built by the Lichchhavis over the relics of Buddha lay somewhere to the north-west of the city and south-east of the pillar of Asoka. It was further thought that the *stupa* had been opened up by Asoka for its relic-contents.

A small mound to the north-east of the tank, conforming to this location, was therefore taken up for excavation, which revealed that the mound represented the ruins of a *stupa,* enlarged four times after its initial construction (pi. VIII B).

The original *stupa* was a small structure, 25 ft. in diameter; it was built of layers of piled-up mud separated from one another by thinner layers of cloddy clay *(gangat}* over a deposit which contained the Northern Black Polished Ware. Sherds of the same Ware were also found in fairly large quantities in the core of the *stupa* as well as in the deposits between the *stupa* and its first enlargement.

The first enlargement was in the shape of a fairly substantial structure, in which burnt bricks, 15 x 9 x 2 in., were used. In the debris outside the enlargement were a few fragments of polished Chunar sandstone, suggesting that it had been carried out in the Mauryan period, probably in the reign of Asoka. On the western side was noticed a breach, subsequently filled up with earth.

The second enlargement was relatively flimsy, being almost entirely of re-used burnt bricks and brick-bats, along with a few mud-bricks. The third enlargement, also of burnt bricks and brick-bats, increased the diameter of the *stupa* to 40 ft. The fourth and last enlargement was mainly in the nature of buttressing the preceding one.

Excavation in the core of the *stupa* showed that it had in its southern sector a breach, 2 ft. 6 in. in width. Within the area disturbed by the breach, near the centre of the *stupa,* was discovered a soapstone casket (pl. IX), cracked by the pressure from above and only one-fourth full of ashy earth, together with a small conch, two glass beads, a small piece of gold-leaf and a copper punch-marked coin.

As will be evident from the foregoing, the *stupa* was initially built during the currency of the N. B. P. Ware, i.e. any time between 600 and 200 B.C., but as its first enlargement probably took place in Mauryan times, its origin went back to pre-Mauryan times. The excavator therefore feels that the stupa could have been the one built by the Lichchhavis over their share of the relics of Buddha immediately after his death. The fact that the relic-casket was found within a breach and was only partially full seems to confirm this identification, for, as tradition says, the *stupa* of the Lichchhavis had been opened up for its relics by Asoka, who is also said to have left behind a portion of the relics for worship by the Lichchhavis. Further, the breach on the western side of the first enlargement (mentioned above) may be ascribed to the post-Asokan ruler who, according to Hiuen Tsang, made an attempt to rifle the *stupa* but gave it up out of fear. Thus, the archaeological and traditional evidences combine to indicate, suggests the excavator, that the excavated *stupa* represented the original Lichchhavi *stupa,* though the absence of any inscription on the casket makes it difficult to be definite on the point.

5. EXCAVATION AT RAJGIR, DISTRICT PATNA.—Shri A. C. Banerji of the Mid-eastern Circle of the Department carried out a small-scale excavation at Rajgir in the area identified as Jivakamravana and brought to light several additional elliptical and oblong structures built variously of stone and bricks (*1953-54,* p. 9; *1954-55,* p. 16). It was also revealed that the long wall made of large blocks of stone overlain with red earth, on the south of the road leading to Griddhrakuta, so long regarded as the inner periphery, was in fact the remains of one of the banks of a large reservoir extending up to the Sonagiri and touching the defence-wall descending from that hill in a crescentic form. The reservoir might probably be identified with Sumagadha of the Pali literature.

6. EXCAVATION AT LOTHAL (SARAGWALA), DISTRICT AHMADABAD.—The Western Circle of the Department, under Shri S. R. Rao, resumed excavation at the mound of Lothal in village Saragwala with a view to finding out the lay-out of the streets, the plan and purpose of the mud-brick platforms and the ceramic sequence at the site with special reference to the black-and-red ware *{1956-57,* p. 15).

The habitation-area of the site was found to have been enclosed by an outer platform of mud-bricks, constructed in the second of the five Sub-periods met with at the site. It was exposed to the extent of 60 ft. and 350 ft. respectively on the southern and eastern sides, on either side without reaching its end. On the western side too, a similar platform was noticed, but its link with the one mentioned above remains to be examined. Available to a maximum height of 4 ft., the outer platform was built over by the drains of the fourth Sub-period. On the eastern side was exposed a 10-ft. high and 3- to 4-ft. wide revetment of kiln-burnt bricks (pl. XII A) over a length of 270 ft., evidently put up to protect the platforms and houses against the floods to which the area seems to have been subjected.

In the south-western sector, of the habitation-area, another block of mud-brick platforms, measuring 70 ft. x 50 ft. and assignable to the third and fourth Sub-periods, was laid bare. On it stood some important buildings flanking an east-west street (pl. XI A). Particularly notable was a 166-ft. long drain of burnt bricks with eight subsidiary drains connecting an equal number of bath-rooms of the houses that stood on the platform (pl. XI B). It was joined by another cross-drain with a steep gradient. A 12-ft. wide street of the second Sub-period, with houses built on either side of it, was partially exposed in the northern sector of the mound (pl. XII B); this alignment was maintained in the third and fourth Sub-periods, but there were encroachments in the fifth. The houses were mostly of mud-bricks, but wherever water had to flow on the plinth or platform a veneer of kiln-burnt bricks was provided. The inhabitants took special care to provide their houses with one or more brick-paved bath-platforms (pi. XIII A) and privies with soakage-jars (pl. XIII B).

Among the other structures were two large houses of mud-bricks and a 24-ft. deep well (pl. X). The occupants of one of the houses, with an open courtyard, 18 ft. x 9 ft., surrounded by six rooms, seem to have been bead-makers, as suggested by a large number of finished and unfinished beads found on a working platform in the courtyard. Near by was a circular furnace, 6 ft. in diameter, with its roof having four openings and its sides plastered with its mud (pl. XIV A); it may have been used for heating the raw bead-material and half-finished beads. In another place, a pottery-kiln, assignable to the fifth Sub-period, was met with.

In five houses, circular or oblong enclosures of bricks and clay, containing ashes, triangular terracotta cakes and oval terracotta balls with four finger-marks, were met with. In the mud-brick enclosure were found charred animal-bones, a gold pendant and a carnelian bead. Large urns with animal skeletal remains., one of them secured in position with bricks along its rim, were also found buried; they contained beakers and bowls, besides beads and bones. While cutting across one of the twelve altars in what has been so far regarded as kiln-area, ashes and bones were noticed below the first two courses of mud-bricks.

In an overall picture, the third and fourth Sub-periods presented the township in its most prosperous stage. The construction of elaborate drains with man-holes and the systematic lay-out of the streets and houses of these Sub-periods pointed to-

wards the existence of a civic authority. Again, it was in these Sub-periods that a vast number of costly personal ornaments and objects of domestic and commercial use were found—all this standing in marked contrast with the poor relics of the first two and last Sub-periods. In the fifth Sub-period the earlier alignment of the streets was ignored, the drains and baths were constructed shabbily with brick-bats and soakage-jars were placed at the end of small localized drains, there being no public drains at all.

The discovery of a cemetery in the north-west corner of the mound was of great importance. In all, six burials, two of which, respectively at the depths of 9 in. and 1 ft. 6 in. below surface, were found disturbed, were noticed. In another burial-pit, two bodies, one each of an adult and a child, were found close to each other, along with shell beads and a copper ring. The bodies were oriented north-south, with the heads to the north (pl. XIV B). The funerary pottery (pl. XVII B) comprised the convex-sided bowl, basin, small jar and dish-on-stand.

Amongst the painted motifs met with in the red ware (pls. XV-XVII A), particular mention may be made of snakes, in one case below a tree (pl. XVI B) and in another case one entering and another emerging out of an ant-hill (pl. XV B), and stags (pls. XV A and XVII A). The black-and-red ware, plain as well as painted, was found in all the Sub-periods, though in small quantities. Some new types of earthen wares also came to notice, viz. hollow and handled circular pot-stands and drain-pipes. Special mention must also be made of potsherds painted in colours and designs seemingly unusual to the Harappa Ware: they had either a buff body painted over in white and black or pink colour or a pink body painted over in white; the designs included multiple horizontal bands and wavy lines (pl. XVI A).

The terracotta human and animal figurines included a human head with an oblong beard, sharp nose and sunken eyes (pl. XVIII C), a mother-goddess (pl. XVIII B), a bull with movable head, a ram-head (pl. XVIII D) and a guerilla (pl. XVIII A). Amongst other terracotta objects was a die, with markings ranging from one to six on its six sides, and a miniature boat.

Amongst the metal objects, particularly noteworthy were two cast copper figurines, one each of the swan and dog, besides a drill, a chisel (pl. XXI B), arrow- and spear-heads, axes (pl. XXI A) and fish-hooks, variously of copper and bronze.

Other small finds included chert blades, cubical weights of chert and agate (pl. XIX A) and beads of gold, copper, jasper, agate, carnelian, steatitie, faience, shell, ivory and bone, in various stages of manufacture. Of the last-named item, eye-beads, etched carnelian beads, stamped steatite beads and an agate bead with a screw in gold deserve special mention.

Twelve seals (pls. XIX B and XX), variously of steatite, agate and terracotta, and two terracotta sealings were found. One of the sealings bore impressions of three different seals above the figure of a bull (pl. XX, 2). On one of the steatite seals could be seen the Indus script engraved above a unicorn (pl. XX, *6).* An excellent example of engraving on hard material was provided by an agate seal (pl. XX, *1).* A terracotta seal depicting a seed-drill (?) (pl. XX, *3)* called for particular attention. But no less important was a potsherd (pl. XX, *4)* with inscribed letters that had no apparent similarity with the Indus script.

7. EXPLORATION IN DISTRICT AHMADNAGAR.—Shri B. P. Bopardikar of the South-western Circle of the Department collected microlithis, comprising nicely-retouched blades and fluted cores of chalcedony, from the river-bed at Chichondi Patil.

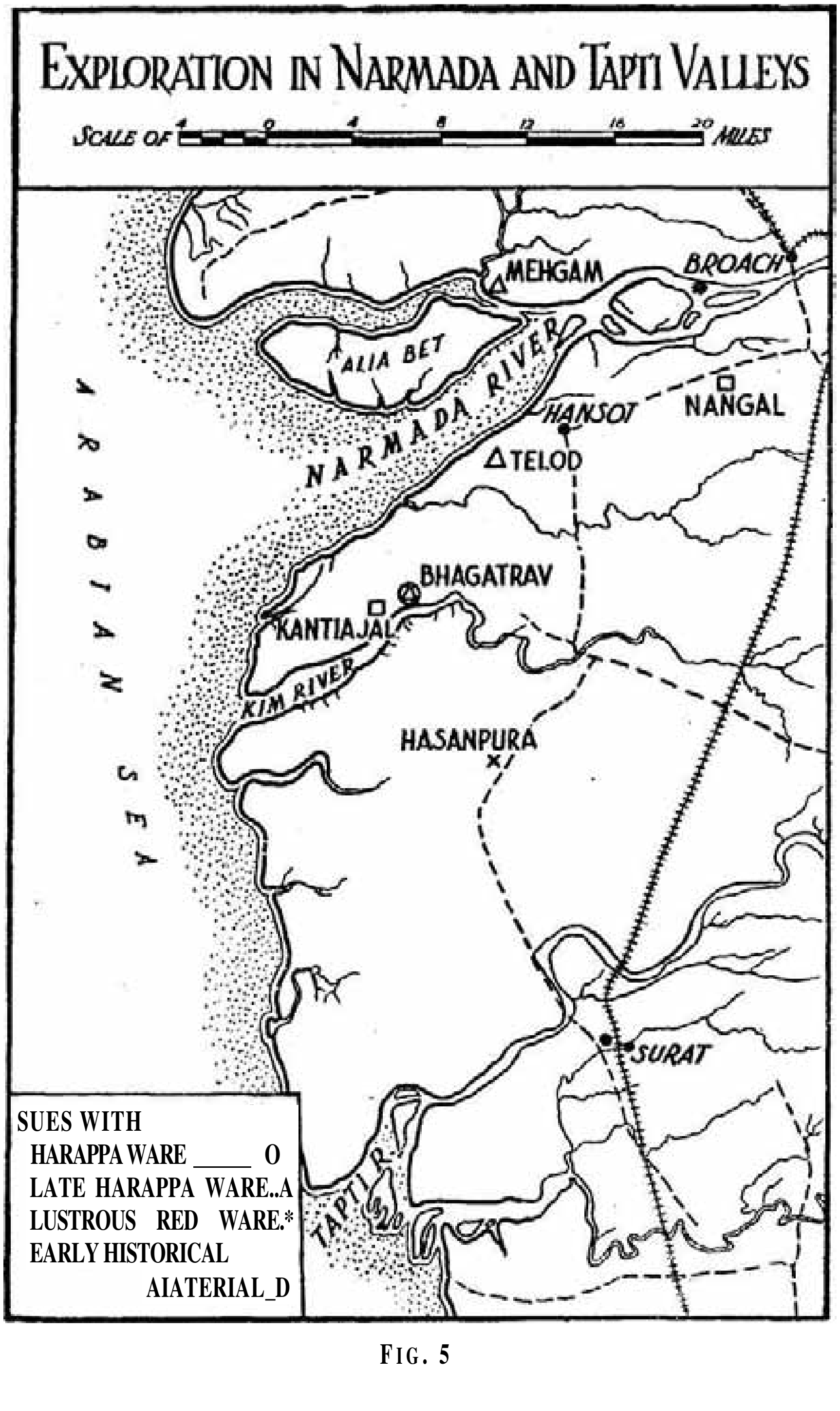

EXPLORATION IN NARMADA AND TAPTI VALLEYS
SCALE OF 4 0 4 8 12 16 20 MILES
MEHGAM
BROACH
ALIA BET
NARMADA RIVER
HANSOT
NANGAL
TELOD
ARABIAN SEA
BHAGATRAV
KANTIAJAL
KIM RIVER
HASANPURA
SURAT
TAPTI R.
SUES WITH
HARAPPA WARE ____ O
LATE HARAPPA WARE..A
LUSTROUS RED WARE.*
EARLY HISTORICAL
AIATERIAL_D

FIG. 5

8. EXPLORATION IN DISTRICT BROAC HAND SURAT.—An exploration of the coastal strip between the Mahi and Tapti rivers by Shri S. R. Rao brought to light four important sites, viz. Bhagatrav, Mehgam, Telod and Hasanpur (fig. 5), of which the first was assignable to the early Harappa period, the second and third to the late Harappa period, and the last to the 'transitional period' between the Harappa and later chalcolithic cultures.

Situated at the mouth of the Kim river, half-a-mile south of village Jetpur in Hansot Taluka of Broach District, and rising gradually to a height of 15 ft. above the surrounding area, the mound of Bhagatrav extends over half-a-mile from south-west to north-east. Trial-pits sunk on the western periphery of the mound revealed 8 ft. of cultural debris representing two different Periods, I and II, assignable respectively to the Harappan and early medieval times. The former was further divisible into two Sub-periods, A and B, representing respectively the early and late phases of the Harappa culture. Sub-period IA, represented by a deposit 4 1/2 ft. in thickness, yielded ceramic types similar to those from Lothal and Rangpur II A, e. g. the carinated dish with projected rim, beaker, dish-on-stand, bowl with short handle, basin, convex-sided bowl and thick storage-jar with splayed rim (fig. 6; pi. XXII A). Made of finely-levigated clay and well-fired, the vessels were sturdy and were painted either in black colour on red or in buff colour on chocolate surface. The use of reserved slip and bichrome or polychrome paintings was noticed on some sherds. The other finds included a terra-cotta bull, two fragmentery chert blades and one faience and two carnelian beads (pl. XXIII B-D). The settlement was destroyed by a flood, as indicated by the eroded surface of the mound and deposits of sand and silt.

Immediately overlying these deposits was a 2-ft. thick deposit of Sub-period IB, wherein was found the late Harappan pottery, such as the dish with short projected rim and small jar with slightly elongated neck (fig. 7).

-In Period II were found the jar and knobbed lid of coarse grey ware, assignable to the early medieval times on the basis of the evidence obtained elsewhere, e.g. at Akota.

Bhagatrav is the southernmost Harappan settlement known so far. It seems to have been a port having contacts with the Harappan sites in Saurashtra.

Mehgam, near Broach on the Narmada estuary, was also subjected to a trial-excavation, which yielded the dish-on-stand, jar with short neck, dish with slightly-carinated shoulder, basin and convex-sided bowl (fig. 8; pls. XXII B and XXIII A). Most of the vessels were painted in black over a red surface, the more noteworthy designs being hatched diamonds, loops, concentric circles, horizontal bands, etc. Amongst other finds, mention may be made of a biconical bead of agate and a few copper fragments.

At Telod, not far from Mehgam, were found the shallow basin, thick storage-jar and dish with expanded rim. The painted motifs included concentric circles, loops with fronds and horizontal bands.

Both Mehgam and Telod are comparable with the late phase of Rangpur IIB, in which the perforated jar, goblet and beaker had ceased to be in use but other Harappa types, such as the dish-on-stand, dish, storage-jar, basin and bowl, were still popular. The lower reaches of the mound at Telod were silted up with black clay, while at Mehgam the entire mound had been almost washed away by the.Narmada which inundates hundreds of square miles every year.

Hasanpur, 2 miles east of Bhatgaon in Olpad Taluka, District Surat, yielded the Lustrous Red Ware and black-and red ware, the more prominent types being the shallow dish with beaded rim, cup with everted rim and bowl with blunt or sharp-carinated shoulder, typical of Rangpur IIC and HI.

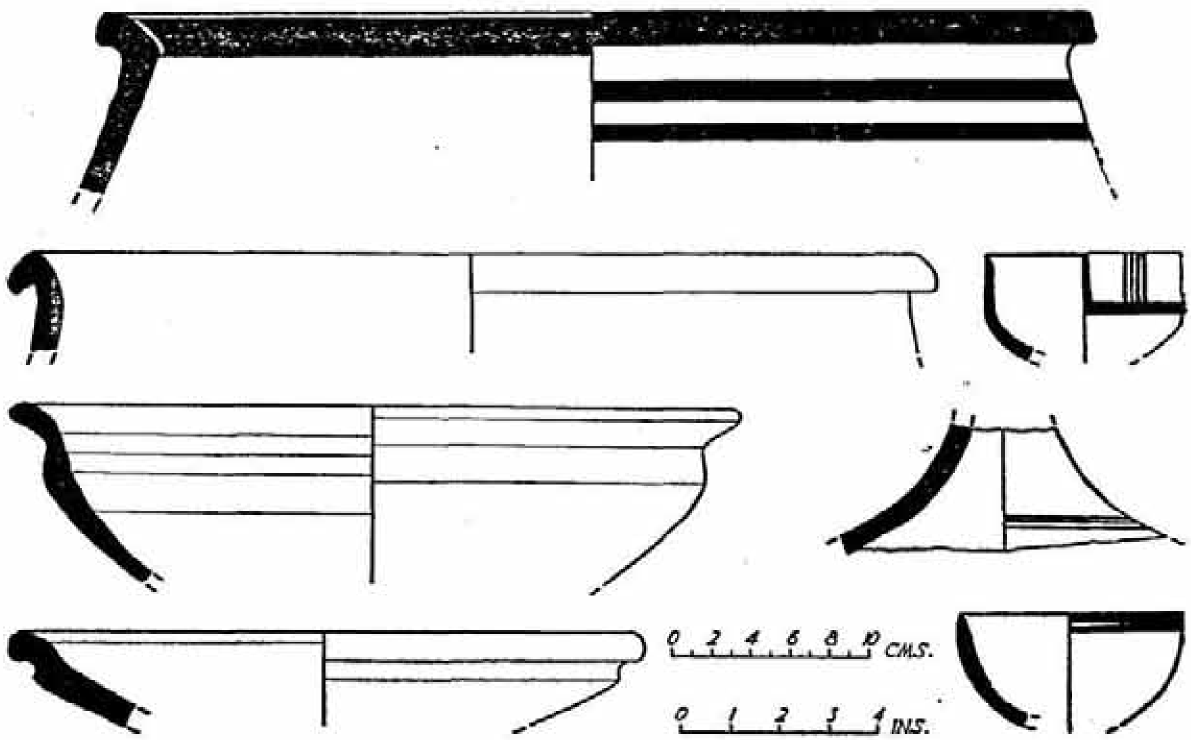


FIG. 6. *Bhagatrav: pottery-types of Period IA*

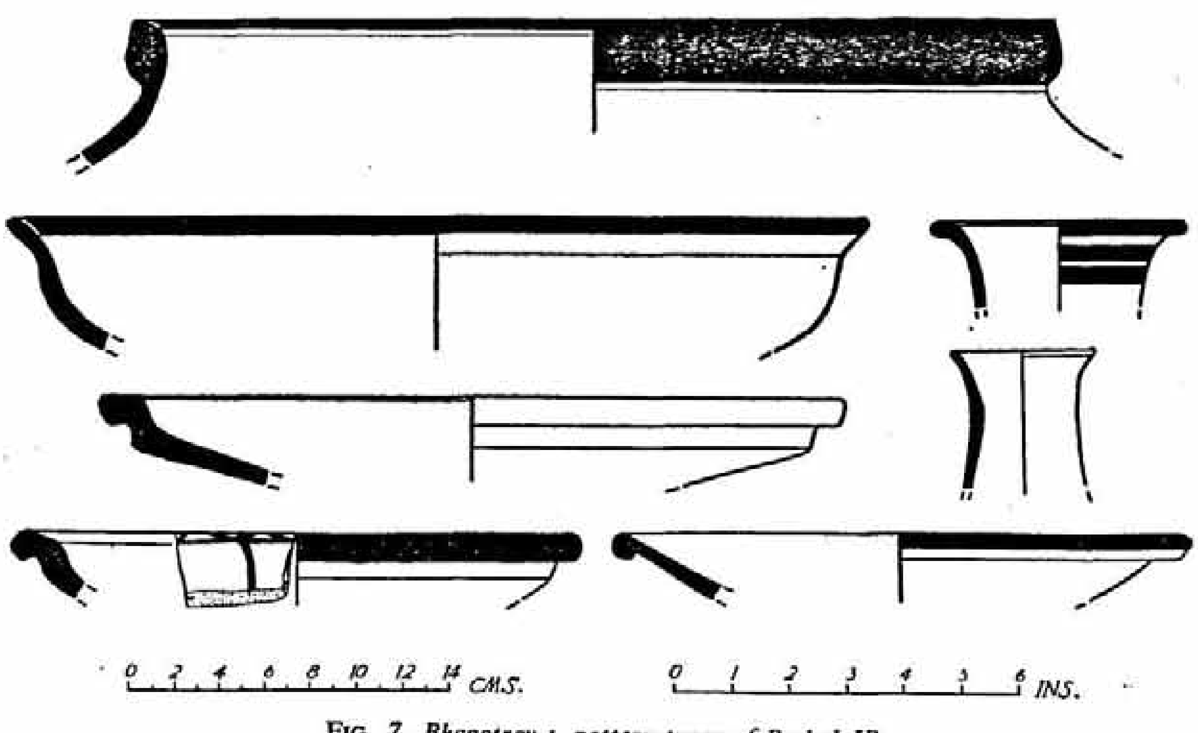


FIG. 7. *Bhagatrav : pottery-types of Period IB*

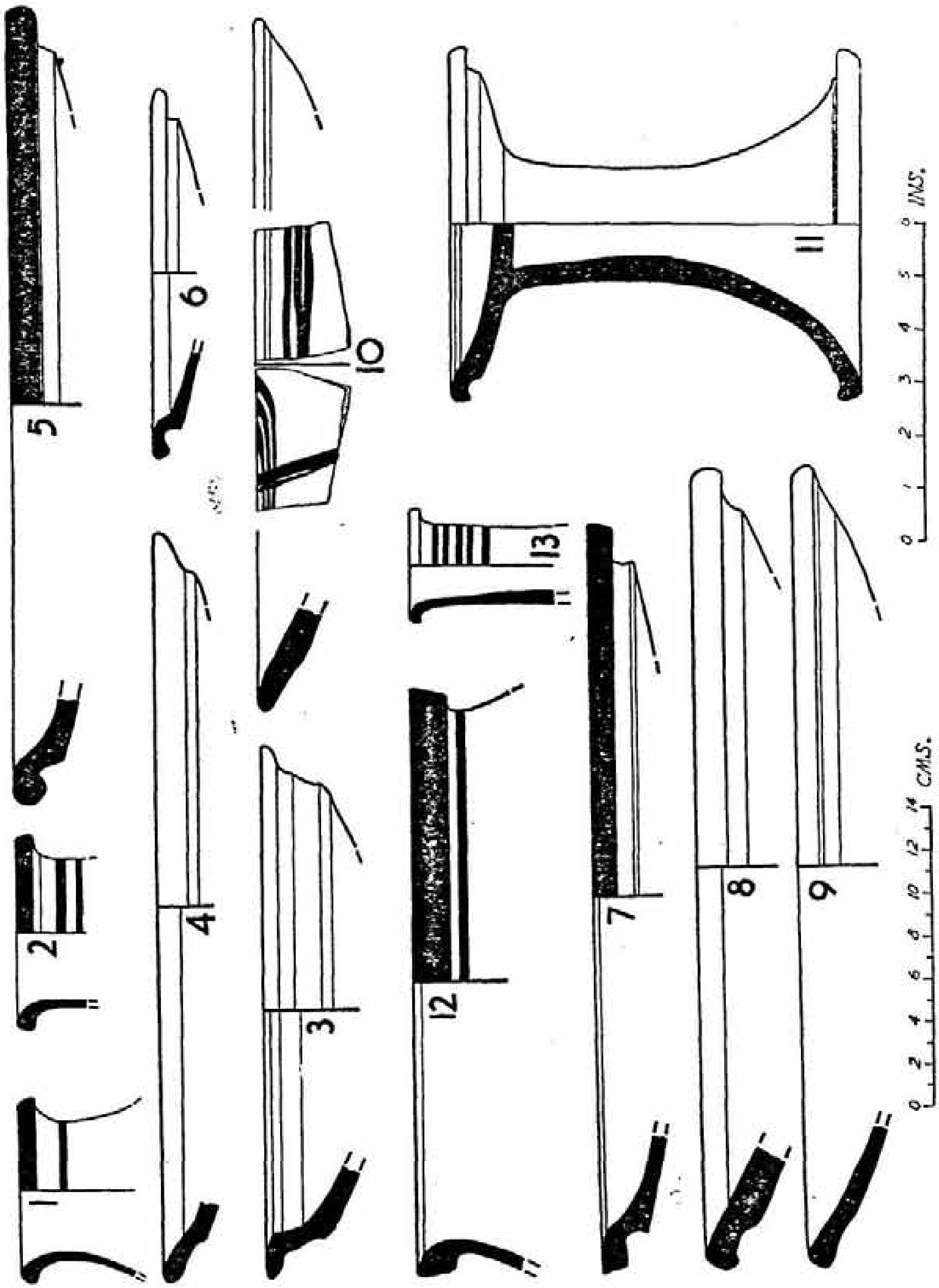


FIG. 8. *Mehgam: pottery-types*

9. EXPLORATION IN DISTRICTS GOHILWAD, HALAR, JHALAWAR, MADHYA SAURASHTRA AND SORATH.—In continuation of his previous work *(1955-56,* p. 70; *1956-57,* p. 16), Shri P. P. Pandya carried out further explorations in these Districts and brought to light three Stone Age, thirtyone Harappan, fiftyfive early historical and forty medieval sites. Of the Harappan sites, three had been also occupied by the people using the Lustrous Red, Prabhas and black-and-red wares.

Tools of Series II, comprising scrapers, borers, points and large flakes of agate and chert (fig. 9), were collected from Rojdi, Sejakpur and Fala, respectively in Districts Madhya Saurashtra, Jhalawar and Halar.

The distribution of the Harappa and other wares is shown in the Table on p. 19, while the main types in the Harappa Ware are illustrated in figs. 10-12 and pi. XXIV. Microliths comprising parallel-sided blades, sometimes showing the crested ridge, and fluted cores were found in association with the Harappa Ware at Adkot, Rojdi, Mandal and Jhanjmer, all in District Madhya Saurashtra.

The exploration included trial-excavations at Rojdi, Pithadia and Adkot in District Madhya Saurashtra and Motidharai in District Gohilwad.

The mound at Rojdi, situated on the bank of the Bhadar river, 34 miles south of Rajkot, was scraped at several places and revealed the remains of a protection-wall made of big boulders. A small trench at the eastern end of the mound brought to light a fragmentary bowl with four Harappan characters. The occupational deposits were divisible into two Sub-periods.

Sub-period IA was distinguished by the typical Harappa Ware, associated with a crude corrugated ware of the type found in Period IA at Prabhas. The more important types of the Harappa Ware comprised the convex, straight-sided, carinated, or handled bowl, pot with round belly and beaded rim, perforated or ledge-necked jar, dish with flared or beaded rim, dish-on-stand, beaker, etc. The ceramic industries revealed two main traditions, viz. those of red and buff wares. The proportion of the former was found to be more than that of the latter. A few sherds of green fabric were

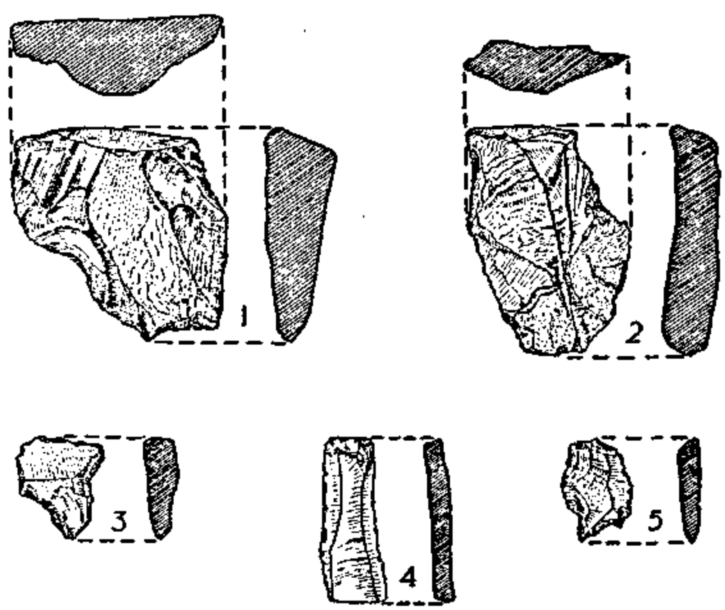


FIG. 9. *Tools of Series II. Rojdi : 1, 3 and 4; Sejakpur : 2; Tala: 5.* (3/7)

DISTRIBUTION OF WARES

(H=Harappa Ware; P=Prabhas Ware; LR=Lustrous Red Ware; BR=Black-and-red Ware (non-megalithic); and RP=Red Polished Ware)

No.	Locality	Site	Ware
	District Gohilwad		
1	Motidharai	Khodiyar	H
	District Halar		
2	Bhayakhakharia	Bhayakhakharia	H
3	Chandrawara	Chandrawara	RP
4	Chandrawara	Vankiner	H
5	Hathala	Khijagol	RP
6	Kalavad	Kotda	H
7	Lalparda	Lalparda	RP
8	Machlivar	Kuthriwad	RP
9	Ranparda	Mulpadar	H
10	Ranparda	Ranparda	H
11	Suriawadar	Damdawa	RP
12	Tankaria	Tankaria	RP
	District Jhalawar		
13	Sejakpur	Sejakpur	RP
	District Madhya Saurashtra		
14	Adkot	Adkot	H
15	Akria	Nanavati	RP
16	Ambardi	Deshamari	RP
17	Ardoi	Ardoi	H&RP
18	Charkhardi	Vaori	RP
19	pholidhar	Jagapipalia	RP
20	Dhudasia	Koha	H
21	Gadharia	Dungarpur	H
22	Goghawadar	Mavaohabha	RP
23	Halenda	Godhapadar	H
24	Jal	Bhamandharo	RP
25	Jam-Ambardi	Malgodh	H
26	Jam-Kandorna	Timaram	H
27	Jamwali	Jalansar	RP
28	Jhanjmir	Belora	H & P
29	Jhanjmir	. Hamaji	RP
30	Jodhpur	Jodhpur	H
31	Kamadia	Khari	RP
32	Khandadhar	Padar	H
33	Khatli	Kalapan	H
34	Kundni	Deudhar	H
35	Makansar	Ajmer	H
36	Mandal	Dad	H
37	Mandal	Mandal	RP
38	Mewasa	Bharad	RP
39	Mewasa	Chaparda	RP
40	Mewasa	Haramatala	RP
41	Mewasa	Khakharba	RP
42	Moti-Khilori	Dhankani	H
43	Moviya	Sasu	RP
44	Parewala	Kundanpur	H
45	Pithadia	Pithadia	H&LR
46	Ramod	Dobaria	RP
47	Rojdi	Rojdi	H&P
48	Santhali	Rajathali	H
49	Sultanpur	Bhamakdal	H
50	Sultanpur	Bhatiwadi	H, P, RP, LR&BR
51	Vora-Kotra	Kalipat	H
	District Sorath		
52	Ajota	Vikamsinh	RP
53	Asakada	Asakada	RP
54	Bharwada	Bharwada	RP
55	Bharwada	Somadwip	RP
56	Bhuwara	Bhuwara	RP
57	Chara	Chara	RP
58	Chalala	Bodka	RP
59	Chaya	Dhingeshwar	RP
60	Degam.	Lavadia	RP
61	Deval	Bhimadenal	RP
62	Dudhiya	Timli	RP
63	Ghantwar	Tithad	RP
64	Harmatia	Harmatia	RP
65	Kadwar	Bhoji	RP
66	Kai	Kai	H
67	Khambhodar	Khambhodar	H.P&RP
68	Kunchri	Charchanes	RP
69	Kunchri	Kharapiaparnes	RP
70	Malsaram	Malsaram	RP
71	Navagam	Dhrosan	H & RP
72	Navagam	Khadakli	RP
73	Ramlechi	Ramlechi	RP
74	Ranawao	Jardeshwar	RP
75	Renawara	Renawara	RP
76	Sarkharia	Devkapatna	RP
77	Simoni	Simoni	RP
78	Tabra	Jilada	RP
79	Talala	Hirneshwar	RP
80	Umri	Bhutda	RP
81	Umri	Tumada	RP
82	Vachhoda	Vachhoda	RP

also found. The designs, painted in black over red, buff or chocolate slip, included fish, leaves, hatched triangles and diamonds, roundels, wavy lines, vertical bands, loops, prancing bull, etc. The pottery was associated with microliths, of which crested-ridge flakes may be particularly mentioned.

Sub-period IB was characterized by a red ware, in which the beaker, perforated jar, ledge-necked vessel and square-rimmed jar were absent. The convex-sided bowl with typical panelled designs comprising vertical bands between two horizontal lines in the Prabhas fabric emerged in the upper levels. The two Sub-periods of Rojdi may be correlated with the corresponding Sub-periods of Prabhas.

The excavation at Adkot, on the bank of the Bhadar, 30 miles south-east of Rajkot, exposed 5 ft. of occupational deposits representing the Harappa culture. The pottery consisted of the convex-sided and short-handled bowl, perforated jar, ledge-necked vessel, dish-on-stand, beaker, etc. Red and buff wares were found almost in equal proportions. The designs, painted in black, comprised a human figure feeding a pet, fish, leaves, suspended loops, hatched diamonds, wavy lines, etc. In addition to the above wares, a crude grey ware, represented by the trough, jar and dish, was also found.

At Pithadia, nearly 44 miles south of Rajkot, the excavation revealed two periods of occupation. Period I was characterized by the Harappa Ware in association with a crude grey ware. Amongst the other finds, mention may be made of conch bangles, terracotta beads and spindle-whorls. Period II was distinguished by the Lustrous Red Ware, in which the dish with or without stand was common.

At Motidharai, 10 miles north-east of Valabhipur, two periods of occupation, with a considerable hiatus in between, were brought to light. Period I was characterized by the Harappa Ware, while Period II was distinguished by crude grey and painted red wares of the early historical times.

10. EXPLORATION IN DISTRICTS KOLABA AND THANA.-Khandivli, 21 miles north of Bombay, has long been known to yield palaeoliths and later Stone Age tools, but the exact chronological positions of these industries in terms of the different epochs of the Pleistocene yet remain to be determined. In order to ascertain if the industries could be assigned to their.proper terraces, which again could be correlated to the corresponding ancient sea-levels, Shri B.B. Lai carried out a preliminary survey of the area lying between the sea-coast on the west and the Western Ghats on the east and between the Ulhas river on the north and the town of Bombay on the south, with fairly encouraging, results. It was observed that the different industries found by Todd in the nullah-section at the back of the Padan Hill near Khandivli were not all *in situ* : the older ones may have originally belonged to a higher terrace to the east, where palaeoliths were collected from a weathered deposit of reddish earth and gravel. This indicated that the different industries could indeed be sorted out according to terraces. Secondly, between the Ghats and the coast, in the valley of the Ulhas, as many as four terraces were observed, not counting the youngest one which is under formation and gets inundated when the sea is in high tide. In a shorter span, a similar set of terraces was noted in the Dahisar valley between Kanheri Hill and Manori Creek, where tools ascribable to Series II were also found on a terrace near the National Park. The river Ulhas, particularly between Thana and Ghor Bandar, provides an ideal link for correlating the different terraces with ancient sea-levels.

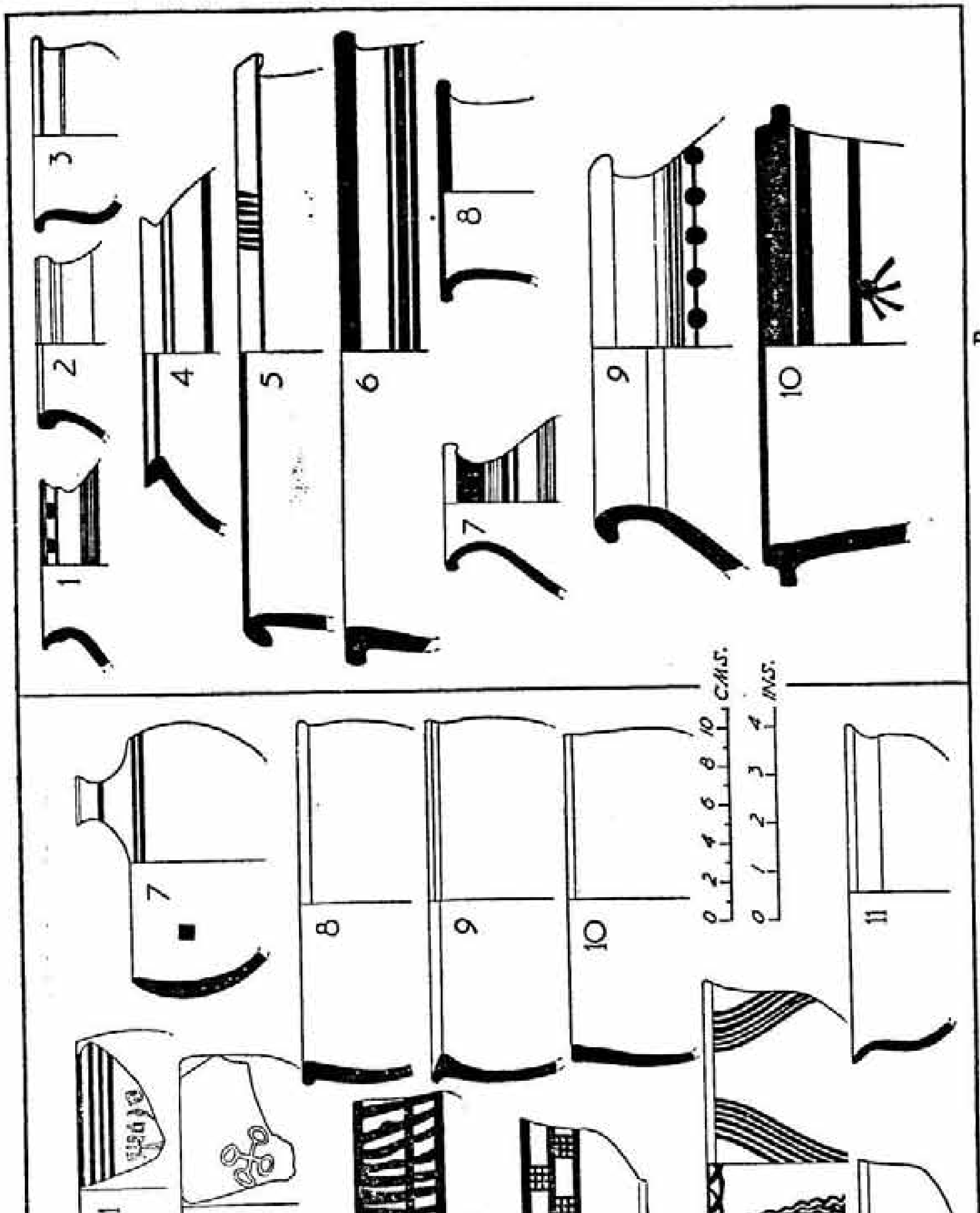


FIG. 10. *Miscellaneous pottery. Rojdi : A1-7, A9-10, B1, B4 and B8; Pithadia : A8; Sultanpur : A11 and B3; Dad : B2 and B9; Adkot : B5-7 and B10*

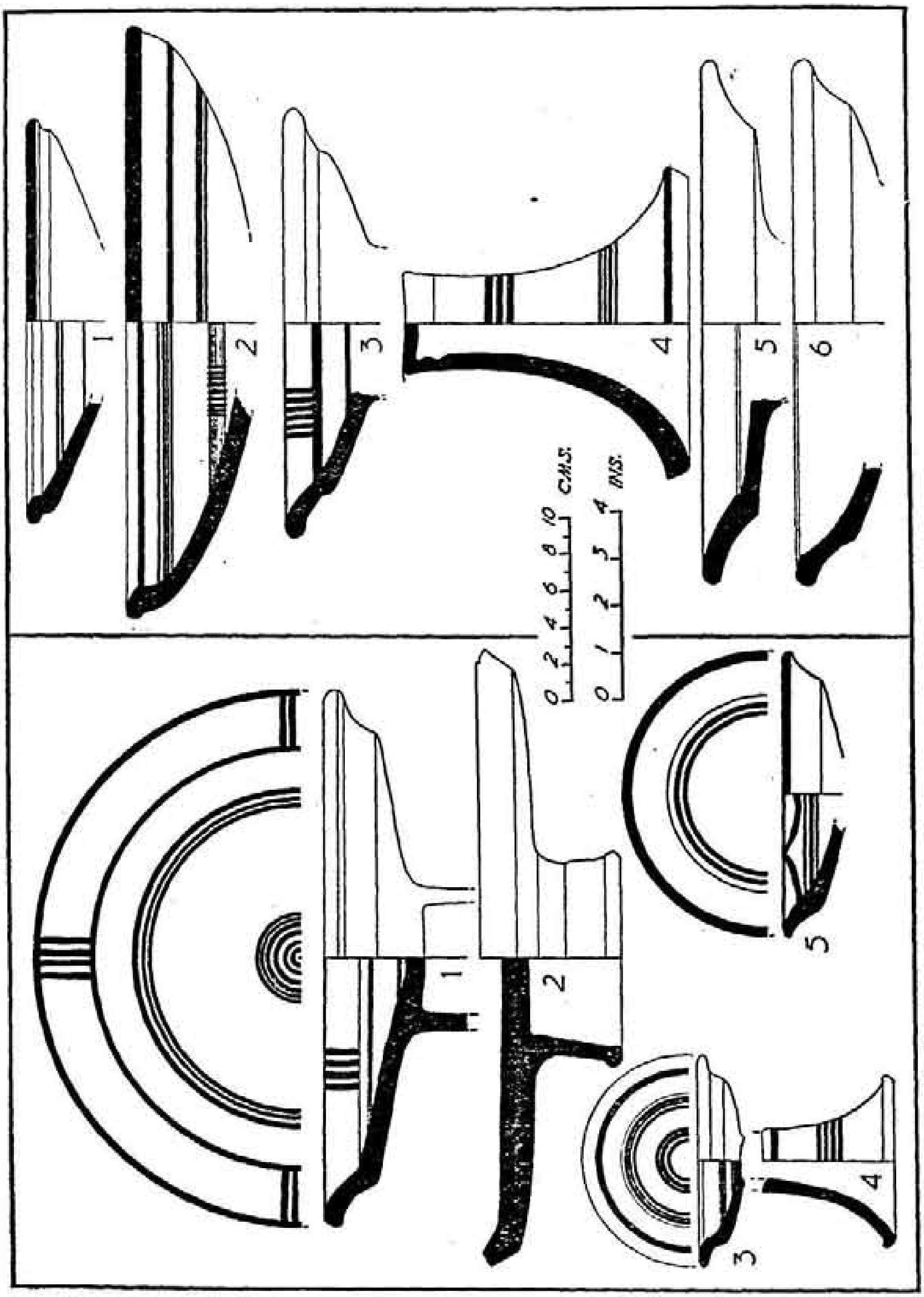


FIG. 11. *Miscellaneous pottery. Rojdi: A1, B3 and B4; Sultanpur: A2, A3, A5, B1 and B2; Dad: A4 and B6; Adkot: B5*

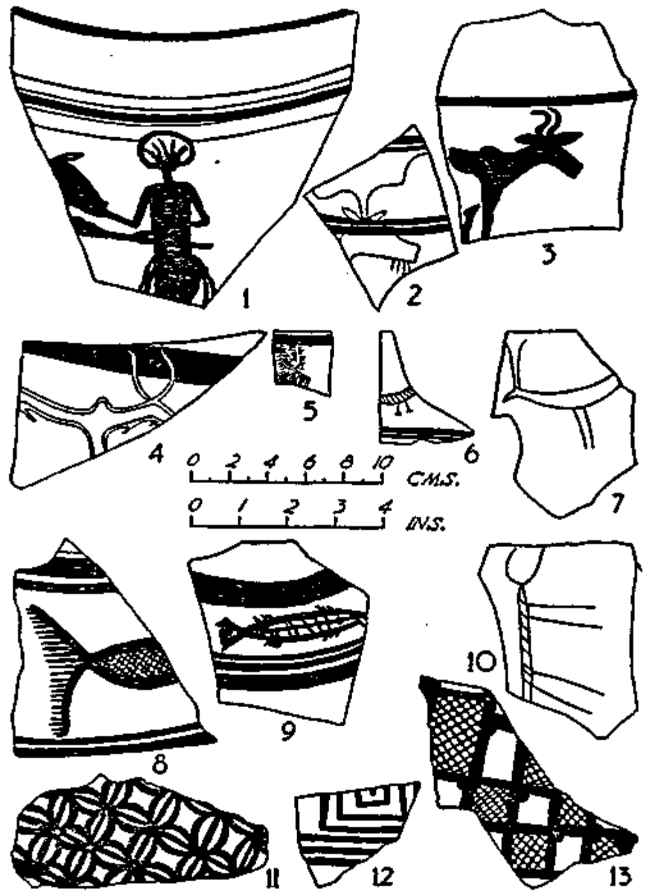


FIG. 12. *Painted pottery. Adkot : 1-3 and 11; Rojdi : 4, 5, 8 and 10; Dad : 6, 7, 9, 12 and 13*

11. EXCAVATION AT TER, DISTRICT OSMANABAD.—The Department of Archaeology, Government of Bombay, under Dr. P. M. Joshi, assisted by Dr. K. D. Banerji and Shri B. N. Chapekar, both of the Deccan College Post-graduate and Research Institute, Poona, carried out excavation at Ter, on the banks of the Terna, 12 miles north-east of Osmanabad. The excavation revealed that the site had been under occupation from *circa* fourth century B.C. to fourth century A.D., as indicated by the presence of the Northern Black Polished Ware and Gupta terracottas, respectively in the lower and upper levels.

No structures were encountered, except floorings made up of either undressed stones and loose brown mud or pounded hemp and lime applied on the black soil below.

Besides the N. B. P. Ware already referred to, mention may be made of the black-and-red ware and Red Polished Ware. The other antiquities included fortyone copper coins, mostly round but of varying sizes, stone querns and millers, iron objects like lamps, arrow- and spear-heads and knife-blades, bone points and beads and bangles of terracotta, shell, glass and stone. Noteworthy was also the discovery of charred grains of rice, wheat and pulses. The site was especially rich in terracottas: of the total

number of seventy recovered specimens, twentyfour were toys and fortysix figurines, most of which were cast in double moulds and some evinced great artistic skill.

12. EXPLORATION IN DISTRICT WEST KHANDESH.—Shri S. A. Sali of the South-western Circle of the Department discovered several ancient sites in the District, mostly on the. banks of the Tapti and its tributaries.

Abbevilleo-Acheulian handaxes, cleavers, discoids, scrapers, etc., made on trap and quartzite, together with pebble tools, were collected from Kirvada, Bhondgaon, Amoda, Sakri, Thalner, Kothali and Manjrpd. At Bhondgaon and Amoda tlie tools were picked up respectively Trom the compact gravel-conglomerate and loose calcareous pebble-conglomerate beds.

Tools of Series II, made on jasper, chert, chalcedony, etc., were collected from the loose gravel-conglomerate bed at Chprgapn, Shajipur, Thalner (pl. XXV A, *4* and *6-18),* Manjrod (pl. XXV A, *1-3* and 5) and Vadhpda. The collection was dominated by scrapers; blades being comparatively few.

Blades, points, scrapers, awls, etc., which may belong to a third Series, were discovered at Shajipur, Sakri, Chorgaon, Thalner, Amoda, Manjrod, Mudavad and Yadhoda. At Vadhbda the tools were collected from a 2-ft. thick deposit of cemented gravel overlying a yellowish silt mixed with *kankar,* which, in its turn, rested on the loose gravel-conglomerate bed yielding Series II tools.

From the uppermost deposit, viz. the Black Cotton Soil, microliths, comprising scrapers, points, blades, arrow-heads, fluted cores, etc., and associated with an ochre-coloured underfired pottery, were found at Dhamdai, Patharai, Nijhar, Grhuh', Palasi, Shjnda, Khodasgaon, Sarvala, Devhala, Shelu, Rakasvada, Kathora, Pimplod (Dhanora), Nalvak Khurd, Karanjakupa, Patonda, Pimplod (Shinda), Loy, Kothali, Takli Pada, Ujnbar Pada, Dhulod, Varul, Shahada, Kolda, Dahidula Budruk, Dahidula Khurd and Lonkhed.

At Shahada$_v$ Anturli, Dahidula Xhurd, Veka, Nalayak. Budruk, Bhondgaon, Chikse, Thalner Lekurwali, Hagri Pada, Chinchoda, Varul, Kolda, Kothali, Lonkhed, Pimplod, Sakri, Hatnur, Bhortek,"Mudavad, Vadhoda and Dliadne, microliths and sometimes neoliths (pl. XXV B) were found in association with the balck-on-red painted pottery, typical of the chalcolithic cultures of the Deccan. Alongside was also found a coarse grey ware, similar to that from the chalcolithic levels at Brahmagiri and Bahal. Of these sites, the first twelve also contained the remains of burials, with which were associated pots of the Black-and-red Ware bearing graffiti. Fragments of thick burial-urns containing skeletal remains were also found. At Anturli, Thalner, Chinchoda, Kothali, Pimplod, Mudavad and Dhadne, the chalcolithic culture had been superimposed successively by cultures with the typical Black-and-red Ware and a coarse red-slipped ware, the latter being assignable to the Satavahana period. At Anturli, Thalner and Lonkhed was also found the Red Polished Ware.

DELHI

13. EXCAVATION AT LAL-KOT AND QILA RAI PITHORA, DELHI.—Among the vast medieval ruins in and around Delhi, Lal-Kot, with Qila Rai Pithora, was, according to Cunningham, the first fortified town. Lal-Kot is reuputed to have been built by Anangapala II of the Tomara dynasty, while the extensive walls of Qila Rai Pithora are believed to have been thrown up by the Chahamana king Prithviraja II, who pos-

sibly utilized Lal-Kot as the inner citadel. To get more precise information about these structures and associated antiquities, trial-excavations were carried out in the area by the North-western Circle of the Department, under Dr. Y. D. Sharma.

The existence of a wall, running from Adham Khan's tomb to the Ranjit and Sohan gates and thus dividing Lal-Kot into two parts, has been known for long. A trench to the north of Adham Khan's tomb was laid across this wall. The original wall, overlying the bed-rock and built of rubble stones, was found to an approximate height of 8 ft. It was noticed that its height had been raised subsequently by the superimposition of kiln-burnt bricks on it, thirty courses of which were found. Leading to the top of the wall was a flight of steps, the lower and upper portions of which were built respectively of stone and brick, corresponding to the respective portions of the wall itself (pl. XXVI A). Possibly the stonework was erected by the Rajputs and the brickwork was added by the Muslims after Delhi had been wrested by them from the former. To the west of this wall there was another stone wall with a regular inner but a rugged outer face. The purpose of the 5-ft. wide passage between the two walls was not clear. To the east of the main wall were several structures showing a continuous housing activity.

A preliminary study of the pottery revealed two cultural phases. The pottery in the earlier phase was plain red, sometimes with red slip, some of the types corresponding to those found in the last period of Ahichchhatra (A. D. 850-1100). The second phase was marked by a gradual introduction of glazed ware and black-slipped grey ware, ascribable to the Muslims. The two phases were separated by a deposit of burnt ash and earth mixed with the debris of fallen structures. The likely pre-Muslim association of the earlier phase was confirmed by a coin of the Rajput bull-and-horseman type picked up from the surface.

A very small trench to the south of the Qutb-Minar brought to light a 5-ft. wide medieval street, the height of the walls on its either side having been raised with the gradual rise of the street-level (pl. XXVI B). In the middle of the street was a lime-plastered open gutter, into which drains from the neighbouring houses fell. Another large-scale clearance of the Lal-Kot walls to the east of the Qutb-Minar ex-posed the exterior face of the fortifications and revealed several late structures.

At Qila Rai Pithora, a trench was sunk across the ramparts to the south-west of the Hodra-ka-Bagh. The bottom of the rampart was reached at 16 ft. below the present top. The 20-ft. wide wall here, the sides of which were retained by a 2 1/2- to 3-ft. wide masonry and the interior filled with earth, showed two types of construction, the lower part built of rubble stones, and the upper of oblong cut stones (pl. XXVII). Here again, it appeared that-the upper portion might have been a later construction during the Muslim rule. On, the inner side of the wall there was an occupational de-posit, varying from 5 to 10 ft. in thickness, ascribable to the same period on the basis of pottery. Several well-laid structures, including an oven and floors of houses, were exposed here.

MADHYA PRADESH

14. EXPLORATION IN DISTRICTS DAMOH, PANNA, RAJGARH, REWA, SATNA AND SHAJAPUR.—The Prehistory Branch of the Department, under Shri K. V. Soundara Rajan and Dr. R. V. Joshi, explored the river-valleys comprised in these Districts and brought to light several sites yielding Stone Age tools of various categories

(pls. XXVIII-XXX). At Bariarpur on the Ken, off Panna, were found developed bifacial tools of the Madras handaxe culture, along with those made on large, rounded quartzite pebbles. The latter, however, had no specific typological relationship with the Early Sohan; instead, the stages of fabrication represented by them revealed their own story of gradual' typological evolution from the unspecialized core to the bifacial handaxe. This emphasizes the need for reviewing the problem of the diffusion and mutual impact of the Sohan and Madras cultures in central and upper India. The handaxes, etc., were seen lying in the highest terrace of the Ken, while a flake-point-scraper industry on chert, jasper, etc., similar to Series II of the Narmada-Godavari valleys, was found at a lower level in the vicinity or in the bed (as at Bira). It is significant to note that at all the sites on the Son or Ken the flake-point-scraper industry was seen to occur at a more or less consistent level in the main profile of the river-cliffs, at about 25 ft. above the riverbed. It was only on the Baghain river, at Kohari and Ramnagar, that a basal cemented gravel-bed yielding this industry was recorded. At Chorhat and Deoland Bridge on the Son were also found, on the topmost levels, i.e. upon the loamy silt, microliths comprising backed blades, points and prismatic cores. Microlithic sites were also located at Chachai Falls and near Govindgarh Tank, in District Rewa, and near the Jamunai hills, off Pahari-Khera, in District Panna.

The Tons valley, from Madhogarh down to the place where the river descends into the Gangetic plains, did not yield any Stone Age tools. At Kojikheri and Harat in the basin of the Sonar, an affluent of the Ken, in District Damon, were found, in the basal cemented conglomerate, tools of the bifacial handaxe-cleaver facies, with a significant lack of pebble tools or any Sohan vestige. Near by, the upper gravels yielded tools of the flake-point-scraper complex on chert and jasper, related to industries in the Son and Ken basins detailed above and also to those in the Narmada-Godavari area.

On the Parvati river three sites of the Madras handaxe culture were recorded, viz. Pilukheri and Kotada in District Rajgarh and one near Ashta in District Shajapur.

15. EXPLORATION IN DISTRICT MANDASOR.—On the completion of a dam on the Chambal, now under construction, an area measuring 266 square miles will be submerged under water. To ensure that no valuable archaeological relics are lost on this account, Dr. M. G. Dikshit, on behalf of the Government of Madhya Pradesh, undertook a survey of the area (fig. 13) and discovered the following.

Along the banks of the Anser, a tributary of the Chambal, were found palaeolithic implements comprising haiidaxes, cleavers, discoids, etc., many of the specimens being rolled.

Three important localities containing rock-shelters were surveyed. The largest group, consisting of thirty shelters, lay in and around village Mori, on the Ram-pura-Bhanpura road. The ceilings and. walls of the shelters were decorated with paintings in red ochre depicting animals (fig. 14, 5), dancing human figures and pastoral scenes, generally assignable to Series III-IV of D. H. Gordon. The other two locali-ties, Chibbar-nala and Sitakhardi, lay amidst rocky highlands in the vicinity of Hing-lajgadh fort near Bhanpura. Here the paintings were executed in red or dark-red ochre and could be assigned to different periods on stylistic grounds. In the Sitakhardi group, geometrical: designs and symbols predominated (fig. 14, *1-4),* while at Chibbar-nala were noted several superimposed layers. The subjects included isolated or grouped figures of animals like the doe, *sambhar,* wild buffalo, spotted



FIG. 13

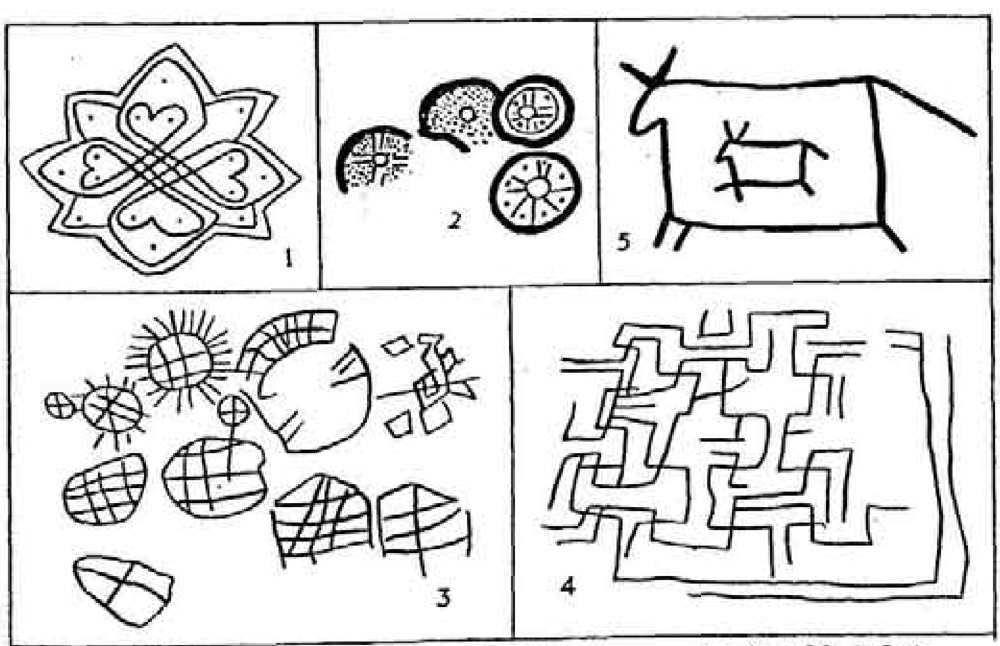


FIG. 14. *Paintings in rock-shelters. Sitakhardi group : 1-4 ($\frac{1}{20}$); Mori: 5 ($\frac{1}{5}$)*

deer, monkey, lizard, etc.,yoked carts, trees with peacocks and hunting scenes showing men armed with battle-axes *(parasu),* bows and arrows, lances, etc. (fig. 15). A figure of a wild buffalo, measuring about 4J ft. across, executed in broad outline, with the head partially filled in (fig. 15, *4),* was one of the most outstanding pictures in the Chibbar-nala group. Microliths comprising long blades, lunates and fluted cores of agate and chalcedony were also encountered in the shelters.

Two sites bearing black-on-red painted pottery and microliths were discovered in the vicinity of Deopur.

Two other already-known sites, viz. Awra and Pasewa, were also visited. At Awra were collected a large number «of potsherds of the black-on-red ware as also microliths, which included a 2-in. long blade with crested ridge. " At Pasewa a small-scale excavation brought to light a network of brick walls, some of them about 11 ft. in height (pi. XXXI). The vast quantity of pottery unearthed presented many interesting types, such as the bowl with featureless rim, lid with pinnacle, spouted vessel, etc. The quantity of painted ware was rather small; the patterns, executed in black over a red body, generally consisted of large bands on necks of large vessels, occasionally with blobs or wavy lines. A large globular vessel with extremely thin walls was found in a lustrous red ware, which, in the present state of our knowledge, is not matched by any

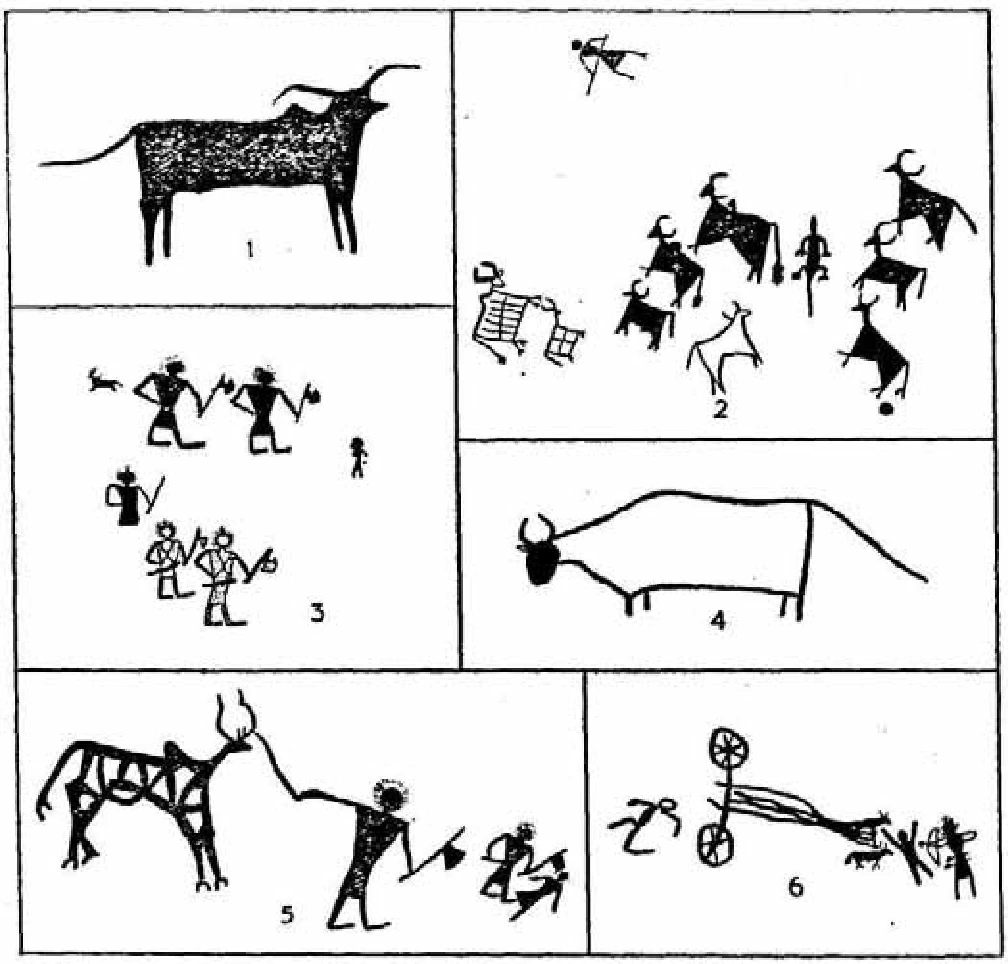


FIG. 15. *Chibbar-nala : paintings in rock-shelters (1 and 2, $\frac{1}{27}$; 3-5, $\frac{1}{6}$; 6, $\frac{1}{4}$)*

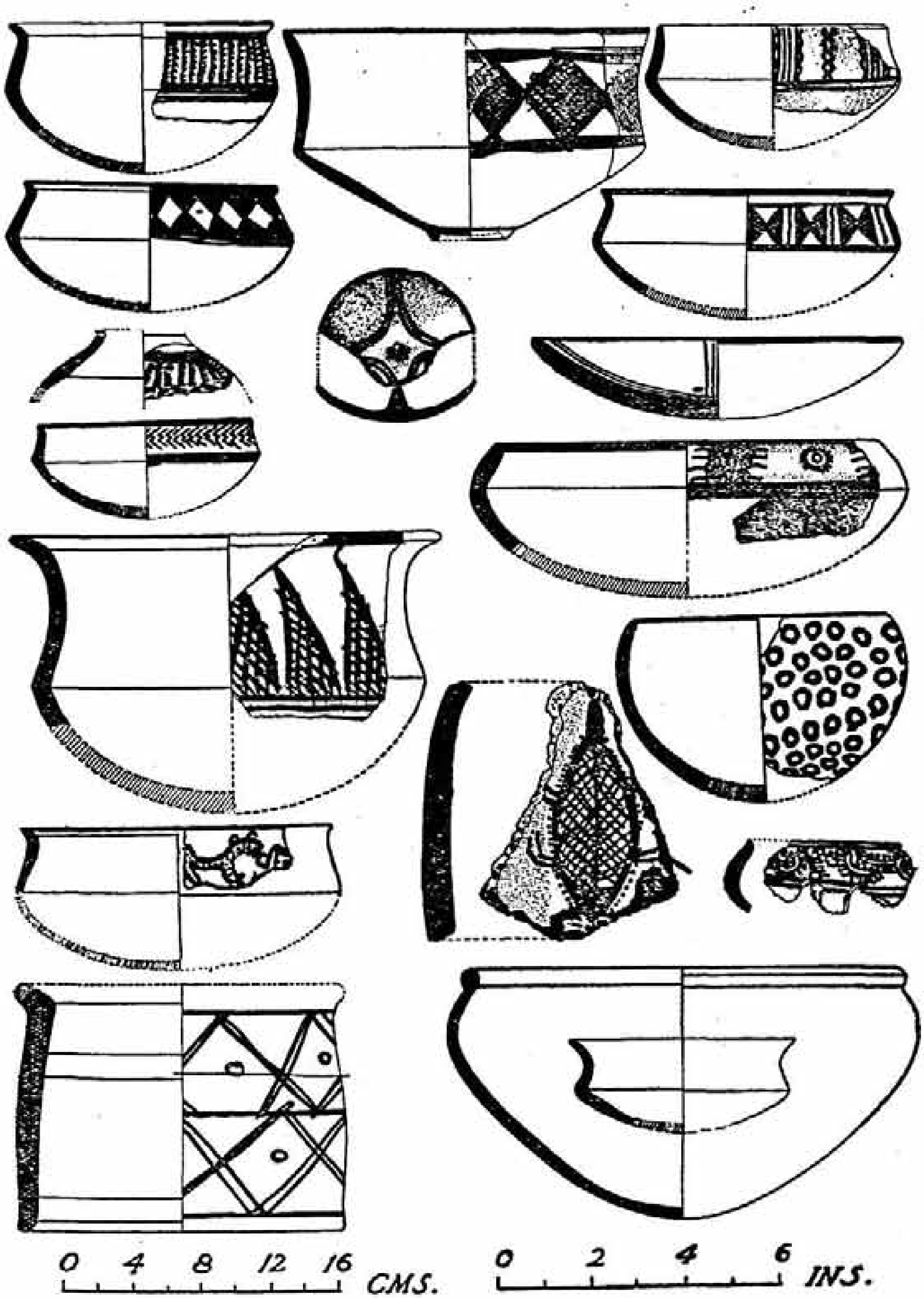


FIG. 16. *Navdatoli : pottery-types*

other specimen. Among other finds were folded glass beads, terracotta bulls and a female monkey holding her child against the breast.

16. EXCAVATION AT NAVDATOLI, DISTRICT MMAD.—In order to get as detailed a picture as possible of the life and times of one of the largest chalcolithic settlements in central India, viz. Navdatoli *(1953-54,* p. 8), a large-scale horizontal excavation was conducted at Mound 4 of the site (pl.- XXXII A) by Drs. H. D. Sankalia and S. B. Deo of the Deccan College Post-graduate and Research Institute, Poona, in collaboration with Drs. B. Subbarao of the Maharaja Sayajirao University of Baroda and H. V. Trivedi, Deputy Director of Archaeology, Government of Madhya Pradesh.

The excavation revealed that the first settlers had occupied an area almost co-extensive with the present size of the mound, that is about 800 ft. from north to south and 600 ft. from east to west. The close juxtaposition of the houses suggested that it had been a nucleated settlement, with narrow passages between the houses, which were of varying sizes and were square, oblong or round on plan (pls. XXXII C and XXXIII A and B). The smallest round hut had a diameter of 7 ft. and the largest 11 ft.; the largest oblong house seems to have been 15 x 10 ft. There was evidence of at least eight floor-levels, the change of a floor-level often meaning a change also in the house-plan; in two cases, round huts replaced the oblong ones of the previous levels. The walls were made of closely-laid series of wooden or bamboo posts plastered on either side with mud, there being further a bamboo or wooden screen between the two principal layers of the mud. The walls were plastered or washed with lime. Wherever the walls had been subsequently burnt, impressions of the screens and posts were left on the burnt lumps of clay. The floors of the houses were made smooth, firm and insect-proof by a spread of lime on the black soil or yellow silt; the depressions, if any, were filled up with black alluvium or sometimes by the burnt debris of the earlier period, plastered over with lime. How the houses were roofed could not be ascertained; but if some of the debris may be taken to belong to the roof, the roof would appear to have been made of clay, bamboo-matting, etc., and supported on wooden posts.

The 10- to 11-ft. thick occupational deposit represented essentially one and the same cultural period, but, owing to certain minor variations in the ceramic industry, it could be divisible into four Sub-periods, named A, B, C and D, beginning with the earliest. Thus, Sub-period A was distinguished by the occurrence, though in a very small quantity, of the bowl of the black-and-red ware, often painted in white and sometimes having low ring-base. The other wares were the black-on-red and the white-slipped ones, the latter occurring in a comparatively small quantity but still having a number of shapes in common with the former. The Sub-period ended in a general conflagration, leaving a layer of burnt debris overlying the latest floor.

Immediately following the above was Sub-period B, marked by a series of lime-and-silt floors. The plan and method of construction of the houses did not change, but in the pottery, a fine, well-baked and slipped red ware appeared for the first time. The principal shapes (figs. 16-18) were the dish-on-stand having an inserted luting arrangement, the globular vessel with high concave sides and the concave carinated small bowl-all having a wavy vertical or geometrical horizontal zigzag decoration. The black-and-red ware with paintings in white had disappeared, but the white-slipped ware continued.

The end of Sub-period B was, again, marked by a wide-spread conflagration, in spite of which, however, the habitation continued. The subsequent Sub-period, C, was distinguished by the presence of a red, well-baked pottery with matt-surface, which had the same shapes and designs as those in the red-slipped ware of the preceding

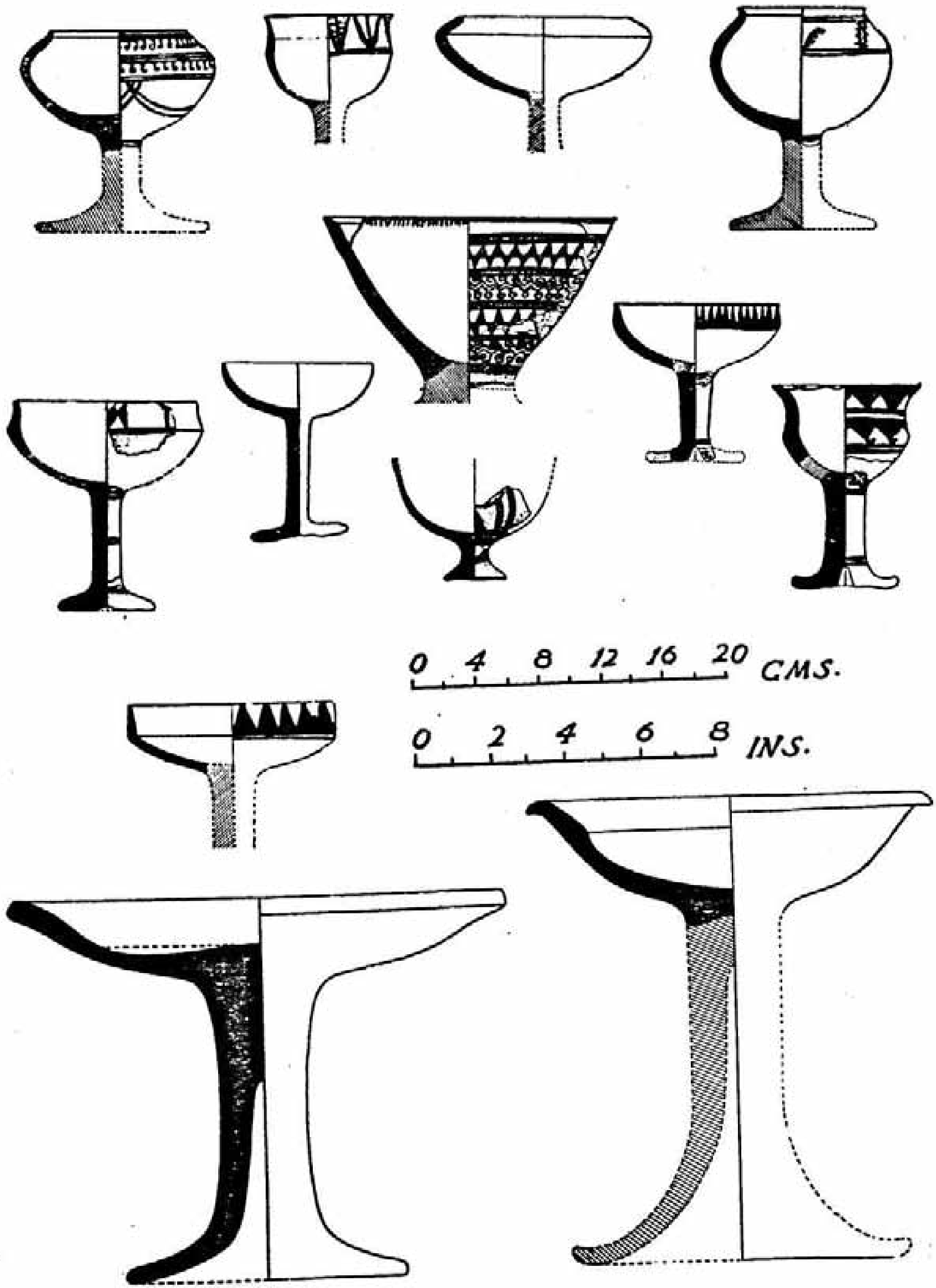


FIG. 17. *Navdatoli : pottery-types*

Sub-period. The white-slipped ware was now considerably less in amount. A noteworthy discovery of this Sub-period was a complete room with oblong and decorated pot-rests *in situ* (pl. XXXIII D).

Sub-period D was characterized, structurally, by the regular use of pebbles for soling the floors (pl. XXXII B) or filling in depressions, and in regard to ceramics, by the first appearance of the channel-spouted cup (pl. XXXIV D) and vessel with round bottom, high grooved neck and dish-like hollow top (fig. 18). There was also the vessel with long tapering side-handles, as in the later amphora, of which, however, only four specimens, two painted on the inside, were found.

In addition to the pottery-types briefly referred to above, there were certain types deserving special mention, e.g. the large dough-plate, sometimes over 1 ft. in diameter, and the storage-jar with coarse but well-baked fabric and incised or applied decoration (pl. XXXIV A-C). A large number of new painted designs were also noticed, of which certain animal-forms, all highly stylized, two human figures, probably symbolic, double spirals, etc., are illustrated (pls. XXXV and XXXVI). There were also the graffiti, which sometimes occurred together with the paintings.

The antiquities included microliths, beads, toys and objects of metal and stone.

Of chacledony, the microliths (pl. XXXVII C) comprised the end-scraper on long flake, pen-knife blade, lunate, trapeze, borer and paralled-sided flake, with provision for hafting in some cases.

In the descending order of frequency, the beads were made of steatite, faience, semi-precious stones, shell and copper. From the point of view of the shape, the most important were star-shaped beads of steatite, faience (pl. XXXVII B) and shell and tubular beads of copper.

Amongst the metallic objects, particular mention may be made of five flat axes of copper (pl. XXXVII A) and wire-rings, bangles, fish-hooks, nail-parers, chisels and thick pins of copper or bronze.

The stone objects (figs. 19 and 20) included rings, mace-heads, saddle-querns, rubbers, hammer-stones, round balls and a polished axe (fig. 20, *3).*

The inhabitants must have known agriculture, as is evidenced by the finds of heavy stone-rings or mace-heads, probably attached to digging-sticks, and of a large amount of charred grains, including wheat, rice, gram, peas, *mung, tivda, kultya,* perhaps *til* (sesame), seeds of a species of beans and *hers.* Of these, wheat was found in all the Sub-periods, while the other grains were confined to Sub-periods C and D. Mention may also be made of the discovery of a clay hearth, plastered over with clay and lime (pl. XXXIII C).

There was definite evidence to show that the chalcolithic layers had been sealed by a deposit containing first the N, B. P. Ware and then the Red Polished Ware. This would indicate *circa* 500 B. C. as the upper limit for the chalcolithic levels. More positive dating evidence comes from the fact that the distinctive channel-spouted cup and certain other pottery-types occurring in Sub-period D are comparable with those found in Cemetery B at Sialk, Iran, which is dated from about 800 to 1000 B. c. Thus, taking into consideration the thickness of the cultural, deposit, with a number of floor-levels and three main conflagrations, the chalcolithic settlement at Navdatoli may safely be dated from *circa* 1200 to 700 B. c.

17. EXCAVATION AT UJJAIN—In continuation of previous year's work *(1956-57,* p. 20), the Excavations Branch of the Department, under Shri N. R. Banerjee, resumed the excavation at the Garh-Kalika mound on the outskirts of Ujjain.

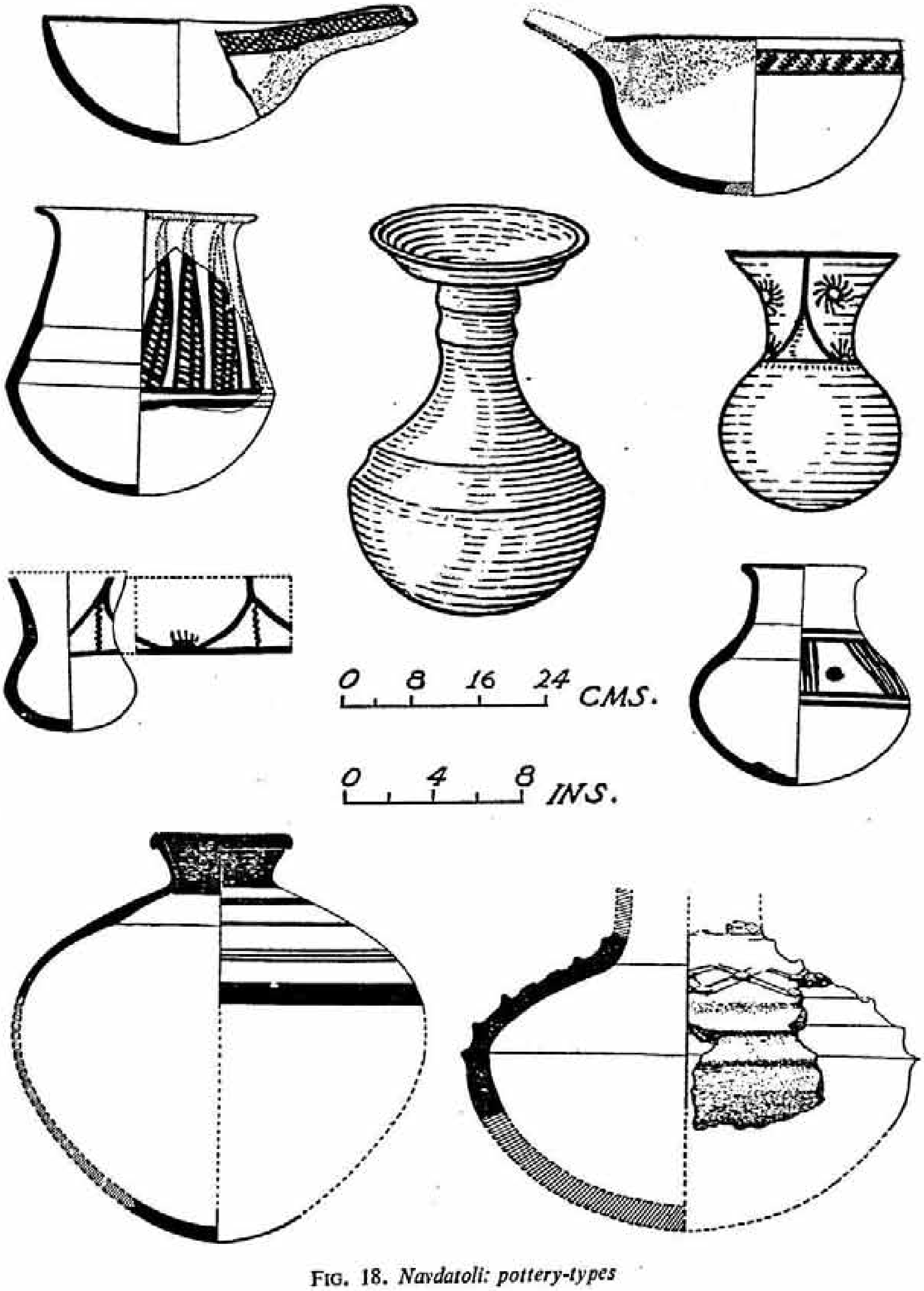


FIG. 18. *Navdatoli: pottery-types*

This year's work revealed that the mud-fortifications, first exposed last year, belonged to a citadel, the humbler habitations being in the undefended areas outside. The rampart was noted to have been 245 ft. broad at the base, and the surrounding moat 152 ft. wide at the top, in the earliest Period, I, datable from *circa* 700 to 500 B.C. The cultural equipment of the people of the Period was characterized by mud-houses, the use of iron in the form of spear- and arrow-heads and knives, terracotta beads and spindle-whorls, bone styluses and diverse pottery comprising a characteristic double-slipped ware with thin black evanescent slip or wash over red surface, besides small quantities of coarse gritty, black-slipped and black-and-red wares. The red-ware dish with inwardly tapering sides and greyish exterior of the base recalls its counterpart from Ahichchhatra and Kausambi. There was also evidence of cattle-slaughter (pl. XXXVIII A).

A couple of bamboo baskets (pl. XXXVIII B) and a few objects of iron, including the curved blade of a spade, were found in the make-up of the rampart, pointing to the equipment employed in its construction.

The western or riverside fortification-wall, being exposed to erosion, was further strengthened during Period I itself, not only by advancing the face riverward but by reinforcing it with wooden logs and sleepers, laid in an elaborate manner (pl. XLI A). This unique feature was observed over a length of 380 ft., roughly corresponding to the inward bend of the river-at this place. With this addition, the fortifications here measured more than 350 ft. in breadth.

During Period II (*circa* 500-200 B.C.), the outer edge of the moat was lined by by a 3 ft. 9 in. wide brick wall (pl. XXXIX A). The brick lining of the succeeding Period, III, showed that during this Period the width of the moat was reduced to 129 ft. At the maximum, the moat seems to have been 27 ft. deep. Comparable with last year's discovery of a bovine skull and associated skeletal remains was the find of a human skull (pl. XXXIX B) and a woven basket of bamboo at the lowest level of the moat. Both the moat and rampart seem to have been in use till a late phase of Period III.

Several openings or breaches along the edge of the mound suggested the probable places where passages through the fortifications may have existed, but on examination they were mostly found filled up with erosional deposits. On the north-eastern periphery of the-mound, however, several successive roads of different Periods (pl. XL), viz. one of Period I, six of Period II, two of Period III and two of Period IV, were revealed. These indicated not merely that there was a major entrance into the fortifications at this point but that, the passage was in constant use during the entire occupation of the site. The constructional details of the roads were no less interesting. A thin veneer of gravel of assorted size was laid over a well-rammed and cambered soling of clay. The road of Period I was 24 ft. wide; those of Period II, varying from 23 ft. to 39 ft. in width, were marked with cart-tracks, the gauge being 5 ft: 9 in. How the moat was crossed remained to be examined.

A large number of unfinished beads of agate and chalcedony, including a group contained in a lidded pot on the mud-floor of a house of Period III, were found associated with sandstone grinding slabs marked by deep and long grooves and several long and deep channel-furnaces (pl. XLII A), evidently used for heating beads. It may be recalled that according to the *Periplus* Ujjayini (called Ozene) was an emporium, from where semi-precious stones were exported to the West, *via* Broach on the Narmada estuary.

The deposits of Period III in the moat yielded a large number of pointed crucibles having a vitriolic surface along with contraptions for blowing air into them.

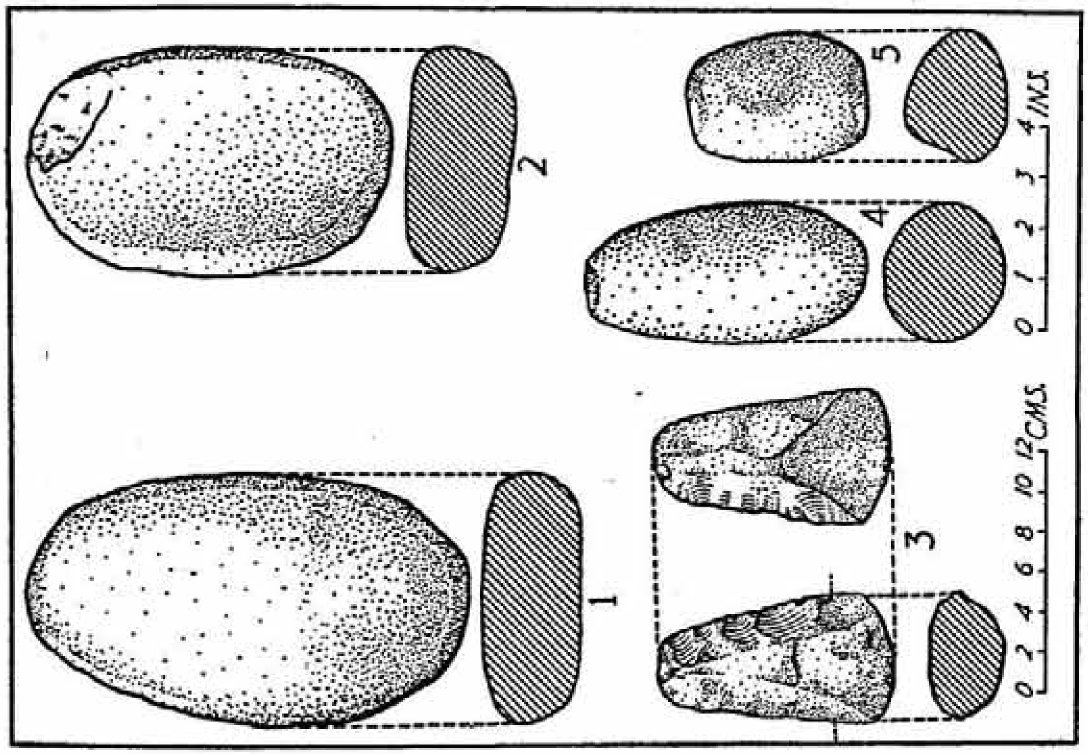


FIG. 20. *Navdatoli: stone objects*

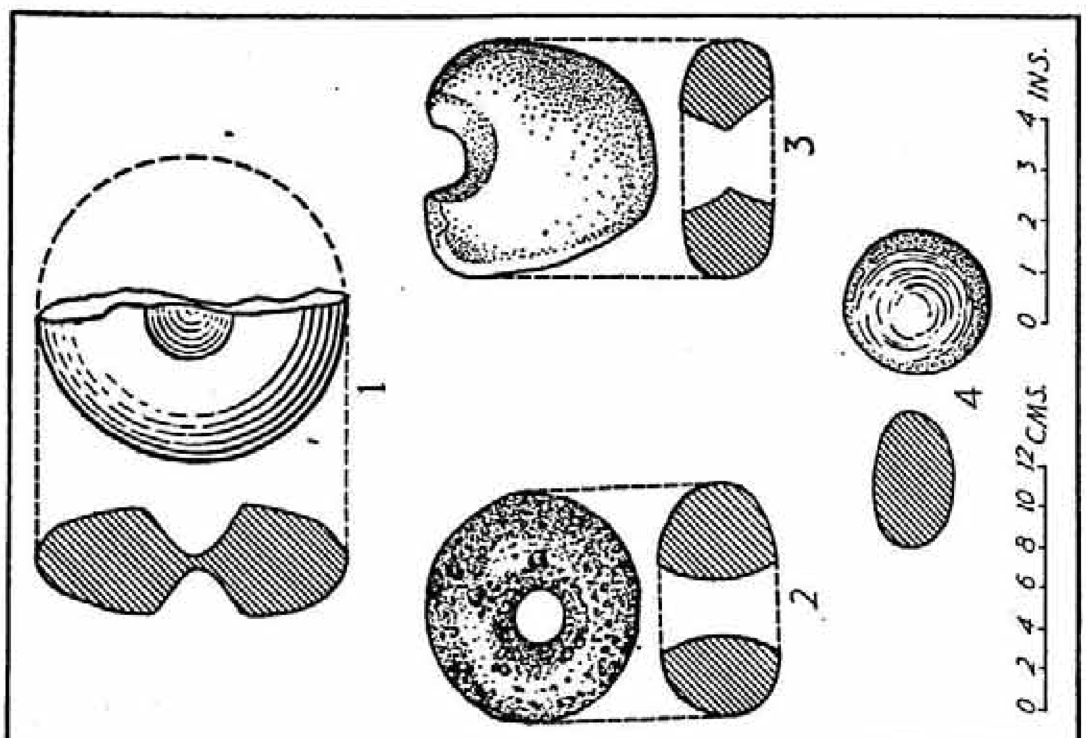


FIG. 19. *Navdatoli : stone objects*

Some of them also contained a residue of copper and lead, pointing to workings in those metals during the Period.

That iron was known to the dwellers of Ujjain right from the earliest Period was confirmed by this year's evidence. Furthermore, enormous quantities of iron slag, lumps of iron ore in the form of limonite, which appears to be locally available in the trap bed-rock, and finished iron objects themselves, in the deposits of Period III, pointed to the prevalence of a flourishing industry of that metal, in which, evidence showed, calcite was used as a flux. The large repertoire of iron objects (pl. XLIV) included arrow-heads, both socketed and tanged, spear-heads, knives, blades, nails, hooks and what appeared to bs a pair of scissors. A noteworthy disocvery was that of a blacksmith's furnace (pl. XLI B) ascribable to Period II.

Amongst the structural remains particular mention may be made of: an apsidal structure, built of columnar dressed stones, belonging to the earliest levels of Period II; a massive burnt-brick tank (pl. XLII B) of Period II; a sunk, brick-lined channel (pl. XLIII A), 36 ft. wide at the top and 8 ft. 6 in. wide at the base, also of Period II; retaining walls in the moat, of Periods II and III; and a 45-ft. deep well of Period II, constructed of wedge-shaped bricks, in one hundred and sixtyfive courses. Terracotta ring-wells were very common in Period III.

The pottery of Period I, along with the associated antiquities, has already been described above. The pottery of Periods II-IV conformed to what had been noted last year.

The other antiquities of Period II included: hair-pins, knitting needles, mirror-handles, combs, and dice of ivory ; arrow-heads (in one case found in a cluster pl. XLIII B), human-shaped pendants, double-pointed styluses and cylindrical caskets of bone; copper antimony-rods; shell and terracotta bangles; beads of ivory, terracotta, agate, jasper, carnelian, crystal, glass, onyx and chalcedony, besides a gold bead of human shape; ear-ornaments of terracotta, jasper, agate, copper and glass; iron arrow- and spear-heads, chisels, knives, daggers, and sickles; terracotta animal and human figurines, including mother-goddesses, cones, gamesmen, balls, and flesh-rubbers; saddle-querns and pestles of stone; and an ivory seal marked with the Ujjain symbol and bearing the inscription *gothajasa tisakasa* in the Brahmi script of the third-second century B.C.

The small finds of Period III comprised: terracotta votive tanks, human and animal figurines, cones, gamesmen, rattles, hollow hair-scratchers and hop-scotches; ivory hair-pins and combs; bone styluses and caskets; copper antimony-rods; bangles of shell, terracotta and glass; ear-ornaments of jasper, crystal and glass; stone dabbers: a copper tortoise marked With impressed circlets all over its body; a casket-lid and a seal, both of terracotta, bearing respectively the inscriptions *Nagabudhisa pravajitasa* and *Asadevasa* in Brahmi characters of the first century A.D.

A large number of coins were also found in the deposits of Periods II, III and IV. Mention may also be made of a terracotta coin-mould showing the effigy of the Roman emperor Augustus Hadrianus.

Period IV was represented by a 10-ft.. thick occupational deposit, which was, however, mostly disturbed by extensive pits dug deliberately towards the end of the occupation. Thus, not many intact structures were encountered. The Period was characterized by unslipped red, dull-grey and mica-dusted wares and Muslim coins.

MADRAS

18. EXCAVATION AT KUNNATTUR, DISTRICT CHINGLEPUT.—The Southern Circle of the Department, under Shri V. D. Krishnaswami and Shri Ballabh Saran, completed the excavation at-Kunnattur, which brought to light a new type of megalithic burial, in addition to the three previously reported upon, and the existence of one more occupational period in the habitation-area (*1955-56,* p. 23; *1956-57,* p. 31).

Megalith 4 proved to be a cairn-circle with a diameter of 30 ft., having an oblong stone-lined pit, 14 x 7 x 6 ft., in the centre (pl. XLVI B). The pots, consisting of the Black-and-red, black and red wares, were mostly placed in the northern half of the pit. The more important types in the Black-and-red Ware included the bowl, dish, ring-stand, lid and conical vessel. The three-legged vase with a tapering profile, globular pot and pyriform urn were all in the red-slipped ware. Iron objects, consisting of flat celts, spear-heads, knives and nails, were placed at the bottom of the pit, but two pairs of horse-bits were found about 1 ft. higher in the pit-filling. No bone was found.

Megalith 5, of anew type, was a cairn-circle, 33 ft. in diameer, with the central oblong pit, 13 x 9 x 6ft., cut right into the hard rock (pl. XLV A). Inside the pit was placed, in an east-west direction, a huge terracotta sarcophagus, measuring 6 ft. 6 in. in length and 2 ft. 8 in. in width and having twentyone legs, in three rows of seven each. Inside the sarcophagus were laid a few vessels of the Black-and-red Ware and an iron pike, 4 ft. 9 in. long (pl. XLV B), and outside it were other iron implements like flat-ceits, knives, daggers and spear-heads. No bone was found. A considerable number of pots, some of them in the Black-and-red Ware and others in plain red ware, were placed in the southern half of the pit. The sarcophagus and the pots were all crushed, probably due to the weight of the cairn-filling.

Outside the pit, towards the south but within the limits of the circle, were similarly interred three smaller legged terracotta sarcophagi, again oriented east-west (pl. XLV A). Sarcophagus A, measuring 4 ft. 6 in. x 1 ft. 5 in., had eight legs in two rows of four each. Inside it were some bowls and conical vessels in the Black-and-red Ware and an iron spear-head. Each of the sarcophagi B and C had six legs, in two rows of three each, and contained some sherds of the Black-and-red Ware. The lids of all the three sarcophagi had holes. No bone was found in any of them, but overlying the cairn-stones, in the north-western portion, were found a few pieces of bones in a broken pot, suggesting a funeral rite after the complete sealing of the pit by the filling.

Megalith 6 had suffered badly due to spoliation. Some fragments of pyriform urns, dressed granite slabs and a copper bowl containing decomposed husk were found within.

Megalith 9, exposed to view through spoliation, contained an open terracotta sarcophagus, 6 ft. 3 in. x 1 ft. 9 in., with twelve legs in two rows of six each. Inside it were placed some human cranial and long bones (towards the east), an adze, two short daggers, a chisel and a spear-head, all of iron, and bowls, dishes, ring-stands and lids of the Black-and-red Ware (pl. XLVI A).

In the habitation-area, besides completing the work in KNT-1, a new trench, KNT-2, measuring 15x10 ft., was dug down to the bed-rock. Three occupational Periods, I-III, were revealed, of which the earliest, I, had not been met with last year.

Period, I, with a thickness up to 2 ft., was contemporary with the megalithic burials. It was characterized by small pits cut into the bed-rock and containing

complete pottery-groups, which included the bowl, dish, knobbed lid, ring-stand, etc., of the Black-and-red Ware and several pots of the red-slipped ware (pl. XLVII). Some beads of quartz, glass and terracotta were also found.

Period II, corresponding to last year's Period I, was divisible into two Sub-periods, A and B. A brick wall, the size of bricks being 11 x 8 x 2 1/2 in., was discovered. The predominant pottery was a sturdy red ware, though the Black-and-red Ware continued in use. A noteworthy feature of the Period was the existence of ring-wells. Amongst the small finds, mention may be made of beads of glass, quartz, paste and carnelian, some badly-corroded copper coins and a few figurines and two seals of terra-cotta, one of the latter having an inscription in characters of *circa* eighth century.

Period III, corresponding to Period II of last year, was clearly separated from the preceding Period by a sterile layer and could be dated to the medieval times. Belonging to it was a brick wall, 4 ft. 3 in. long, the size of the bricks being 9 x 4 1/2 x in. A well-preserved ring-well, about 3 ft. in diameter, was also exposed down to the sub-soil water-level. It was noticed that although originating in Period II, it had continued in use in Period III.

19. EXPLORATION IN DISTRICT COIMBATORE.—Shri V.N. Srinivasa Desikar of the Southern Circle of the Department discovered the following: cairn-circles at Virapandi, Gudalur, Billichi and Vellamadai; a double-chambered port-hole cist at Kalapatti; urn-burials atJPeriyanayakanpalayam; the Russet-coated Painted Ware at Vellaimedu in Kalapatti, at Nattamedu in Sircarsamakkulam and opposite the Nava-koti-narayana-perumal temple at Ottakalmantapan; and two neolithic implements, a celt and a hammer-stone (pl. XLVIII, *1* and *2),* in the vicinity of an urn-burial site at Sircarsamakkulam. The celt had a triangular outline and an almost oblong transverse section.

20. EXPLORATION IN DISTRICT MADURAI.—Shri B.K. Gururaja Rao and Shri K.V. Raman, both of the Southern Circle of the Department, brought to light sites of various categories, viz. microlithic and neolithic sites, sites with the Russet-coated Painted Ware, having both rectilinear and wavy-line designs, in association with the megalithic Black-and-red Ware, sites with urn-burials of different types with or without megalithic appendage and a few habitation-sites.

At Kollanpatrai, near Kodangipatti, were discovered two small finely-polished stone celts, trapezoidal in shape and roughly oblong in transverse,section (pl. XLVIII, *3* and *4),* and a broken hammer-stone. A similar celt (pls. XLVIII, 5) was found at Karuppannaswamikoilmedu in Karuvelampatti. Kollanpatrai and Thathanodaimedu, near Bodinayakanur, yielded microlithic implements comprising blades, flakes and cores. The latter site also contained the Russet-coated Painted Ware as well as urn-burials, though it is doubtful if the culture represented by the microlithic industry had anything to do with that represented by the painted pottery and urn-burials. Urn-burials were also found at Nagamalai Pudukkottai, Sengulam, Vedar Puliangulam, Melakuyilkudi, Palanganattam, Paravai, Samayanallur, Vilangudi, Tenur and Podum-bu Sikandar Chavadi, while more Russet-coated Painted Ware came from Karuppanna-swamikoilmedu and Rishaban Tidal site in Avaniapuram. At Nagamalai Pudu-kkottai and Alampatti were located respectively cairn-circles and dolmens. Mounds with remains of ancient habitation were noticed at Kochchadai, Tenur and Playanattam, on the banks of the river Vaigai, and at Samattivaram, Vadapalanji and Avaniapuram.

MYSORE

21. EXPLORATION IN DISTRICT BIJAPUR.—Shri A. Sundara of the South-western Circle of the Department discovered the following ancient sites, located variously on the banks of the Bhima or its tributaries, viz. the Indihalla, Doddahalla, Navilehalla, etc. : Dulakheda, Ingalgi, Jirankalgi, Indi, Gugihal, Kenginal, Masali Khurd, Ballolli, Bhairangi, Benkanhalli, Tamba, Hanchinal, Rodgi, Khydgi, Lingadhalli, Atharga, Shivpur Khurd, Inchgeri, Satalga (Indi) and Taddevadi. Of these, the first fourteen yielded the painted black-on-red pottery characteristic of the chalcolithic cultures of the Deccan and a thick grey ware similar to that found at Brahmagiri and Bahal in association with microliths. Further, the first seven sites also yielded neolithic tools, mostly axes, made on fine-grained trap (pl. XXV B, *1-3* and 5-7). Sherds of the Red Polished Ware were collected from Ingalgi, Indi, Lingadhalli, Atharga, Shivpur Khurd, Inchgeri, Satalga (Indi) and Taddevadi.

The discovery of a large number of sites in so small an area emphasizes the close distribution of the chalcolithic culture in the southern Deccan.

22. EXPLORATION IN DISTRICT DHARWAR.—Shri M.S. Nagaraj Rao of the South-western Circle of the Department discovered at Akkur, on the bank of the Varada river, a site ascribable to the Satavahana period.

ORISSA

23. EXCAVATION AT RATNAGIRI, DISTRICT CUTTACK.—Of the ruins of the Buddhist establishments on the hills of Lalitagiri, Udayagiri and Ratnagiri (Lat. 20° 38' N., Long. 86° 20' E.), a part of those on the last-named hill was excavated by the Eastern Circle of the Department, under Shrimati D. Mitra.

The most prominent of the ruined edifices was a brick *stupa,* situated in the south-western part of the hill, which was completely exposed (pl. XLIX) and constituted the focus of the excavated remains. Its base had an elaborate but symmetrical plan. Discounting the projections, it was a 47-ft. square, each side facing a cardinal direction and consisting of five recesses and six projections, of the latter of which the central two jutted out beyond the rest. Each projection, in turn, was composed of small but prominent facets forming re-entrant angles. The horizontal mouldings consisted of receding and projecting courses of bricks, sometimes chamfered and half-round. The maximum available height of the vertical face of the base was 9 ft., but there is little doubt that it had originally been higher.

The facade of the *stupa* was very carefully executed with chiselled and rubbed bricks, laid in mud but having very fine joints; it also bore traces of plaster of shell-lime here and there. With its recesses and projections, it must have originally produced a delightful effect of light and shade.

At what height the square of the *stupa*-base gave way to the circle of the drum it was difficult to determine in the absence of any vestige of the facing brickwork of the superstructure. It was noticed that in the laying of the bricks in the core no attempt had been made to produce a circular effect, except at the extant top level, which had wedge-shaped spoke-like walls converging towards the central round platform, 10 ft. 10 in. in diameter. There was no evidence of. the prior existence of a *pradakshina-patha* at any level, nor of staircase in any direction.

A pit, 6 ft. 9 in. square, excavated in the centre of the *stupa,* showed that its solid core consisted of regularly-laid brick-courses, numbering sixtyfive from the bottom to the extant top and attaining a height of 16 ft. 7in. It was also noticed that between the bed-rock and the lowest brick-course was a packing of rammed stone chips and earth varying in thickness from 6 in. to 1 ft. 6 in., laid in order to level the undulating rock-surface. No relic of any sort was found in the pit. However, it is not impossible that the relic, if any, had been deposited at a level higher than the present top, or else it lies at a spot other than the centre.

The area around the *stupa* contained several minor *stupas* of varying dimensions and base-forms. They were mostly of stone (Khondolite), either monolithic or structural, but sometimes also of bricks. On the eastern-side, which was studded with them, they stood at three different levels (pl. L A), the lowest of which might be contemporary with the early phase of the main *stupa* and the other two later. It is, however, also likely that, on further investigation, some of the minor *stupas* may be found even to antedate the main *stupa.*

Some of these *stupas* had, on one or all of the four faces, figures of Buddha, Tara, Avalokitesvara and sometimes divinities of the typical Vajrayana pantheon like Vajra-Tara. In the structural *stupas* they were sometimes of chlorite and were fixed into the niches in the body (pls. L B and LIV); in the monolithic ones they were either so fixed or carved out of the monoliths themselves. On the analogy of their counter-parts at other Buddhist sites, they may generally be regarded as votive in nature, with or without the enshrinement of some inscribed texts. However, in two cases their fune-rary character was obvious, for near their bottoms there were sockets, in one case plugged by a stone cube of the required size, containing bone-relics (pl. LIII).

While Ratnagiri, as stated above, shared with other Buddhist sites the characteristic of the existence of minor *stupas* near the main edifice of worship, a unique feature here was the existence of hundreds of miniature monolithic *stupas* (pl. LI), often with decorative bands of lotus-petals, beaded tassels issuing from the mouths of *kirtti-mukhas* and *vajras,* mostly relieved with Mahayana-Vajrayana deities and sometimes inscribed with the Buddhist creed, lying in a pell-mell condition over a wide area to the south-west of the main *stupa,* somewhat away from it. They might have been dedicated at this spot reserved for the purpose, or the enormous group formed an *atelier* for their sale.

There is no direct evidence for dating the main *stupa* or its ancillary structures. However, of the *dharani-texts* and the Buddhist creed found inscribed on some of the stone *stupas* of the eastern group, situated at a level 1 ft. 10 in. higher than the initial level of the main *stupa,* there was one which, on palaeographical grounds, was ascribable to the late eighth or early ninth century. The construction of the main *stupa* must, therefore, have taken place prior to that period. At the same time, that there existed earlier Buddhist edifices at Ratnagiri is conclusively proved by the discovery in the midst of the debris, of a stone slab inscribed with the *Pratitya-samutpada-sutra* in characters of the Gupta period. In accordance with the practice, prevalent in the Gupta times, of enshrining this particular text inside *stupas,* as evidenced at Nalanda, Kusinagara and Gopalpur, the Ratnagiri record also must have been originally placed inside a contemporary *stupa.*

The last phase of the main *stupa* was represented by an attempted restoration in the form of the erection of two circular walls (pl. LII A), built at two different levels, round it. They gave the *stupa* a circular plan, the space between the top of the lower (outer) wall and the base of the higher (inner) one probably serving as a *pradakshina-*

patha. Simultaneously, a wide quadrilateral compound-wall of bricks (pl. LIIB), brick-bats and stone fragments was erected to enclose a wide area round the renovated *stupa.* A fairly large number of small- to medium-sized Buddhist stone sculptures (pls. LV and LVI), stone slabs and terracotta plaques, bearing inscribed texts of *dharanis* and the Buddhist creed, were found in the debris round the *stupa.*

24. EXPLORATION IN DISTRICT DHENKANAL, MAYURBHANJ AND SUNDARGARH.— Shri G. D. Mohapatra of the Deccan College Post-graduate and Research Institute, Poona, surveyed northern Orissa (fig. 21), as a result of which nearly a dozen sites with palaeolithic tools of Series I were found along the Brahmani river in Dhenkanal District. Further upstream in Bonai Sub-division of Sundargarh District, tools of Series II were found, either near the hills where jasper is exposed or in the beds of small streams, tributaries of the Brahmani. Tools of Series I are comparatively rare in this area.

Another isolated site with Series I tools was found at Bishalbury, nearly 12 miles from Sundargarh on the Sundargarh-Jharsuguda road. The tools occurred around an outcrop of milky quartz on the river Saphei, a tributary of the river Ib.

In Mayurbhanj, the major object was the search for sites with tools of Series II. As a result of the exploration, six such sites were discovered in Panchpir and Bamanghati Sub-divisions, very near similar sites of Chaibasa and Chakradharpur in Bihar. In eastern Mayurbhanj, tools of Series II are totally absent, though those of Series I are found in profusion, e.g. at Kuliana, Mahulia and Pratappur. An explanation of this may lie in the non-availability in this region of raw materials like jasper, chalcedony, chert, etc., used in the manufacture of tools of Series II.

Some of the tools of Series II, both from Sundargarh and Mayurbhanj Districts, showed a characteristic microlithic tendency. They comprised some burins and blades and may be regarded as the predecessors of microliths found in the neighbouring areas of Bihar. So far, no real microlith has been found in Orissa.

Polished stone celts were found at Jangra, on the bank of the Brahmani in Bonai Sub-division of Sundargarh District.

A table showing the distribution of tools of Series I and II is appended below.

DISTRIBUTION OF TOOLS OF SERIES I AND II

(**7=** *Series I; 11= Series II)*

No.	Locality	Site	Tool-type
		District Dhenkanal	
1	Bhimkand	Neighbouring fields	I
2	Chakrasil	Forest	
3	Harichandanpur	Forest	
4	Hindol Road	Bed of a small nullah	
5	Kaliakata	Forest	
6	Kharagprasad	R. Brahmani	
7	Kulei	R. Brahmani and the hill-slopes	
8	Pallahara	Mankara nullah	
9	Parang	Bed of a small nullah and the neighbouring fields	I
10	Talcher	Laterite-gravels and R. Brahmani	
		District Mayurbhanj	
11	Banspal	R. Son	I
12	Bonaikala	Khadkei nullah	II
13	Barasol	Khairi nullah and . Bhandan nullah	I & **II**
14	Bar Manda	Khadkei nullah	II
15	Bijatala	Bankabal nullah	I & II
16	Domuhani	R. Burhabalang	I
17	Ghantasila	Laterite quarry near R. Gangahar	I
18	Mahulia	R. Burhabalang	I
19	Naujora	Naujora nullah	II
20	Pratappur	R. Burhabalang	I
21	Rairangpur	Khadkei nullah	II
		District Sundargarh	
22	Bhaludungri	Surface	II
23	Bhanjgarh	Surface	II
24	Bishalbury	R. Saphei	I
25	Jangra	R. Brahmani	I
26	Khuntagaon	Karapani nullah	II
27	Kurhadi	R. Kurhadi	II

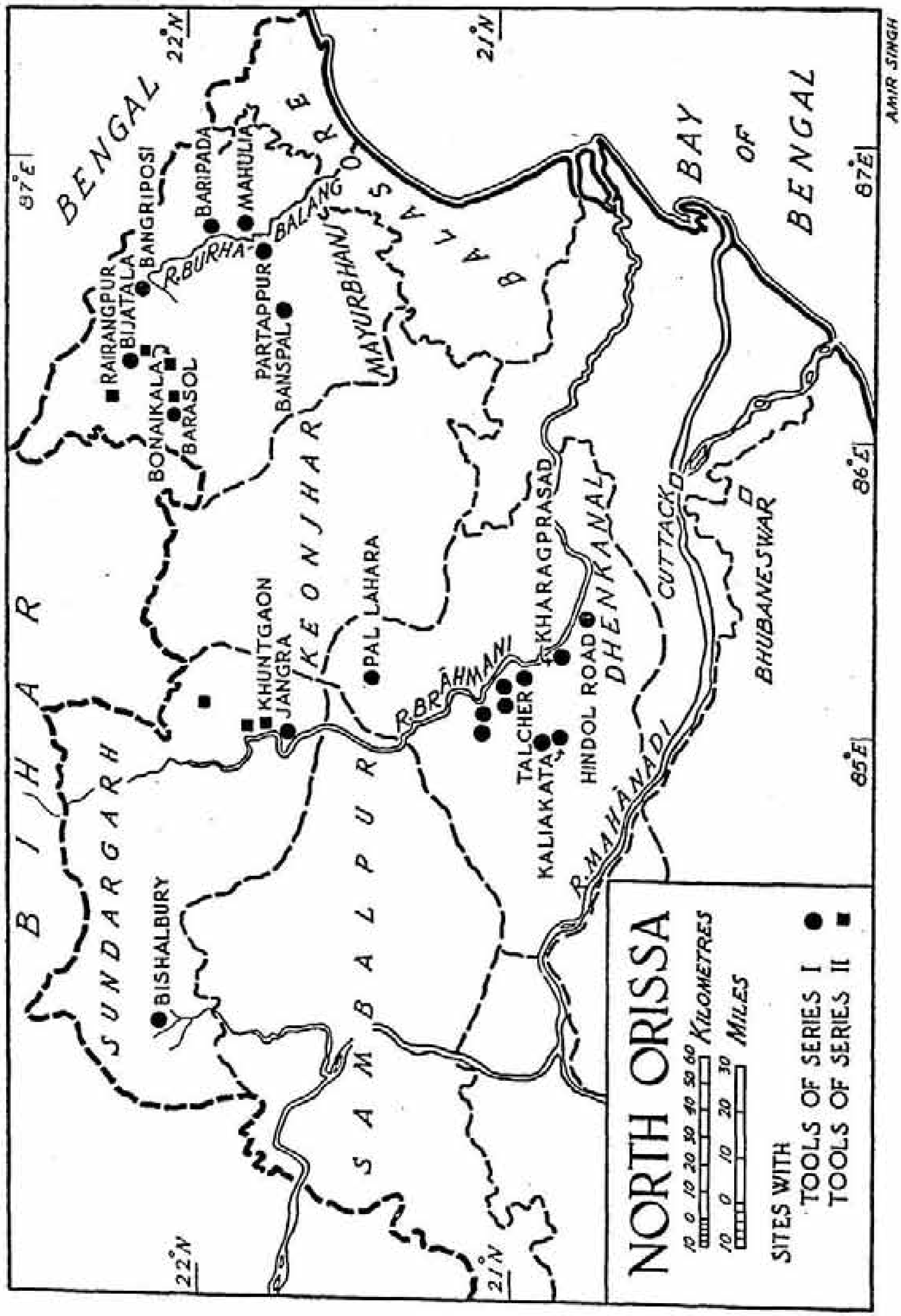

NORTH ORISSA
KILOMETRES
MILES
SITES WITH
TOOLS OF SERIES I
TOOLS OF SERIES II
BIHAR
BENGAL
BAY OF BENGAL
SUNDARGARH
SAMBALPUR
KEONJHAR
MAYURBHANJ
BALASORE
DHENKANAL
CUTTACK
BHUBANESWAR
R. BRAHMANI
R. MAHANADI
R. BURHA-BALANG
BISHALBURY
KHUNTGAON
JANGRA
PAL LAHARA
TALCHER
KALIAKATA
HINDOL ROAD
KHARAGPRASAD
RAIRANGPUR
BIJATALA
BANGRIPOSI
BONAIKALA
BARASOL
BARIPADA
MAHULIA
PARTAPPUR
BANSPAL
22°N
21°N
85°E
86°E
87°E
AMIR SINGH

FIG. 21

PANJAB

25. EXPLORATION IN THE BANGANGA VALLEY, DISTRICT KANGRA.—A team consisting of Drs. H. D. Sankalia and B. Subbarao, respectively of the Deccan College Post-graduate and Research Institute, Poona, and the Maharaja Sayajirao University of Baroda, Shri S. C. Awasthi of the Geological Survey of India and Dr. K. N. Puri, Shri B.B. Lal, Shri K. V. Soundara Rajan and Dr. R. V. Joshi of the Department explored the valley of the Banganga, a tributary of the Beas, with a view to finding out if and how the lithic industries and associated terraces previously discovered in the region could be correlated with the different glacial and interglacial epochs of the Pleistocene. Besides yielding more Stone Age artefacts, the survey brought to light useful data which it is proposed to check up by a second season's work in the upper reaches of the same river.

Between Guler and Kangra and higher up at Nagrota, the Banganga valley was found carved into a series of five terraces, lying approximately at the heights of 540, 325, 190, 90 and 25 ft. respectively above the present river-level. The general composition of the terraces was of an unconsolidated boulder-bed mantled, by a layer of brownish silt. An evidence of the Quaternary glacial movement was met with within the third terrace (T_3) from the top in the form of the occurrence, here and there, of huge granitic blocks or 'erratics', which had evidently moved down the Banganga foreland from their parental source much further upstream. The general valley-profile and other topographical features of the terraces suggested diatrophic movement, apart from periglacial climatic changes and alternative aggradational and erosional regimes, as one of the probable factors for the present valley-formation. The observation of boulder clays, presumably constituting mud-flows caused by tributary glacial movement in the vicinity of Palampur and Asa Bridge, would point to promising glacial ground-data in the upper valley, since the river rises from permanent snow-beds of the Supdhar hills of the Daula Dhar range. Thus, with further work upstream, it may be possible to determine the exact relationship between the implementiferous fluviatile gravels on the terraces, and the advancing and retreating glacial epochs in the area.

The artefacts picked up at Guler and near Kangra indicated a rather slow and conservative pace in the technical development of the Early Sohan. The incidence of the Late Sohan traits was none too prominent, even in the lower terraces. There was also a total absence of the typical tools of the Madras handaxe culture, although such a commingling had been noticed in the Potwar region (Pakistan) by De Terra and Paterson.

RAJASTHAN

26. EXPLORATION IN DISTRICTS BHILWARA, CHITORGARH AND UDAIPUR.— In continuation of last year's work *(1956-57,* p. 8), the Exploration Branch, under Dr. K. N. Puri, resumed exploration in the south-eastern part of Rajasthan. The valleys of the Banas and its affluents, Kothari and Berach, up to Bilio, a village situated at the confluence of the Kothari and Banas, were thoroughly combed, bringing to light a number of ancient sites (fig. 22) with either microliths or black-and-red ware or both.

Microliths made of chert, jasper, chalcedony and agate and comprising blades, points, side- and end-scrapers, fluted cores and crested-ridge flakes were collected from

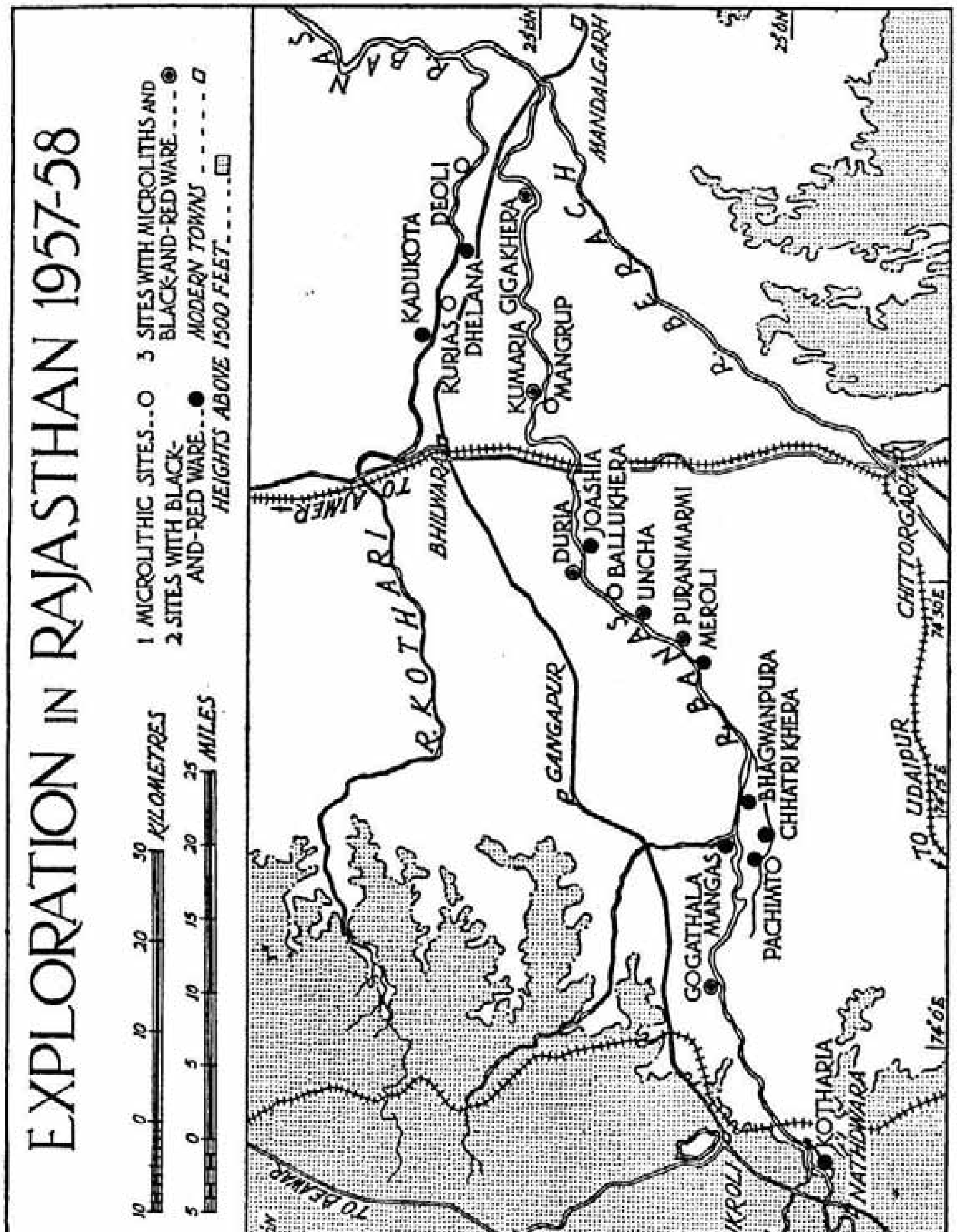

EXPLORATION IN RAJASTHAN 1957-58
KILOMETRES
MILES
1 MICROLITHIC SITES..O
2 SITES WITH BLACK-AND-RED WARE..●
3 SITES WITH MICROLITHS AND BLACK-AND-RED WARE
MODERN TOWNS
HEIGHTS ABOVE 1500 FEET
KADUKOTA
DEOLI
RURIAS
DHELANA
KUMARIA
GIGAKHERA
MANGRUP
MANDALGARH
BHILWARA
TO AJMER
R. KOTHARI
DURIA
JOASHIA
BALLUKHERA
UNCHA
PURANI MARMI
MEROLI
R. BANAS
R. BERACH
CHITTORGARH
GANGAPUR
BHAGWANPURA
CHHATRI KHERA
PACHIMTO
MANGAS
GOGATHALA
TO UDAIPUR
KOTHARIA
NATHDWARA
KANKROLI
TO BEAWAR

FIG. 22

Kurias (pl. LVII, *14* and *23),* Deoli (pl. LVII, *11)* and Mangrup in District Bhilwara and Ballu Khera (pi. LVII, *8, 9, 12* and *22)* in District Chitorgarh. There was no associated pottery.

Duria, Giga Khera (pl. LVII, *2-7, 10* and 79) and Kumaria in District Bhilwara, Uncha (pl. LVII, *1* and *13)* and Purani Marmi (pi. LVII, *15, 17, 18, 20* and *21)* in District Chitorgarh and Goga Thala (pl. LVII, *16)* in District Udaipur yielded both black-and-red ware and microliths. The latter included leaf-shaped points, finely-retouched blades, triangles and end-scrapers.

Amongst the sites with black-and-red ware alone, mention may be made of Kadukota, Joashia and Dhelana in District Bhilwara, Meroli, Bhagwanpura, Chhatri Khera and, Pachimto in District Chitorgarh and Kotharia and Mangas in District Udaipur. The more important types in the ware were the bowl with flaring or splayed-out rim and convex sides, or sharpened rim and almost straight sides, or incurved or flaring rim and blunt-carinated shoulder, or flaring rim and flanged shoulder, or rounded bottom and straight-edged, flattened or obliquely-cut rim, the vase with splayed-out rim and blunt-carinated shoulder and the dish with sharpened rim (fig. 23). Beautiful painted designs, executed in dull-white pigment both internally and externally, were noticeable on a fairly large number of pots (pl. LVIII). The motifs included concentric circles, vertical strokes, wavy lines in groups, cross-hatched lozenges, oblique lines in groups from different directions, dots, vertical lines and dots and wavy lines joined to a horizontal band.

In addition to the material mentioned above, Bhagwanpura, Goga Thala and Purani Marmi also yielded black-on-red painted sherds with various designs, such as horizontal bands, cross-hatched diamonds enclosed by horizontal bands and dots between vertical lines. The first-named site, with a deposit of about 20 ft., deserves particular attention, as it contained, besides the black-and-red and black-on-red wares already mentioned, dishes of grey ware with straight sides and incurved rim (fig. 23, *20),* of the type found in Period III of Hastinapura.

27. FURTHER EXPLORATION IN DISTRICT CHITORGARH.—Some of the tributaries of the Berach river were surveyed by Shri S. R. Rao of the Western Circle of the Department, as a result of which two palaeolithic sites were discovered between Chitorgarh and Menal. It may be recalled that during 1954-55 a few other palaeolithic sites had been discovered in the region *(1954-55,* p. 58).

A nullah near Bichore yielded palaeoliths in large numbers (pl. LIX A). In the cliff-section, there lay, over the gneissic bed-rock, a 2- to 3-ft. thick deposit of compact conglomerate, which, in turn, was superimposed successively by deposits of loose gravel and brownish clay. All but three tools were found loose in the river-bed; of the three, two lay at the top of the cliff, while one, a cleaver, was extracted from the compact conglomerate-bed. The industry may be regarded as late Acheulian in character.

Further north of Bichore is a rivulet which takes a 100-ft. leap from the rocky cliffs near the Menal temples and joins the Berach near Mandi after flowing past a village called Shamaria no. 1. Near this village were found palaeolithic tools, mostly made on flakes and heavily rolled. They included ovates and cleavers, besides a fine specimen of the Acheulian handaxe (pl. LIX B). Two scrapers were the only specimens of core-tools. The concerned cliff-section revealed the following deposits over the gneissic bed-rock: shale, 4 ft.; gravel-conglomerate, 7 to 8 ft.; silt, 2 ft.; and black soil, 2 ft.

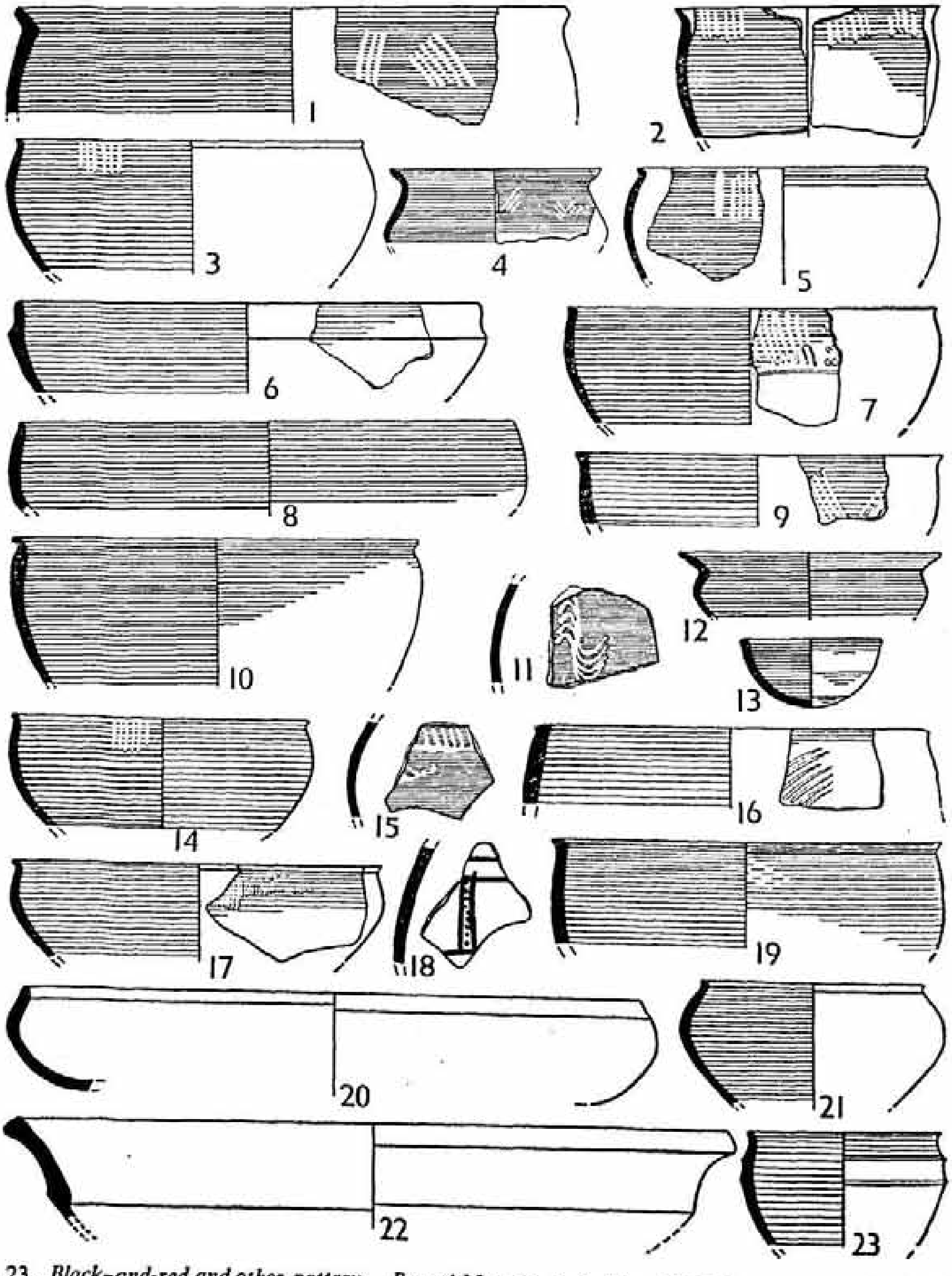


FIG. 23. *Black-and-red and other pottery. Purani Marmi : 1, 4, 10 and 23; Bhagwanpura : 2, 7, 16, 18, 20 and 22; Kumaria : 3, 5, 8, 12, 14, 15 and 21; Joashia : 6; Pachimto : 9, 11, 13, 17 and 19*

UTTAR PRADESH

28. EXCAVATION AT KAUSAMBI, DISTRICT ALLAHABAD.—The University of Allahabad continued its excavation at Kausambi under Shri G. R. Sharma. Previous excavation at the eastern gateway of the city had brought to light a 262-ft. long wall forming the northern flank of the gateway-complex *(1954-55,* p. 18). This year's trenches across the defences opposite the terminal point of the 330-ft. long curtain-wall of the gateway brought to light five main Periods of the defences, besides a pre-defence deposit with fine grey ware including a few painted specimens.

In the earliest Period, I, the defences consisted of a mud wall with a burnt-brick revetment on the exterior, the latter being available to a height of 42 ft. 5 in. and comprising one hundred and fiftyfour courses of bricks (pl. LX). The first thirty courses from the bottom showed a batter of about 15° from the vertical and the upper courses 40°, the bricks being laid throughout in the English bond. Up to the first thirty courses the revetment was also covered by a 2- to 2 1/2-in. thick mud-plaster. At a height of about 6 ft. from the bottom there were a number of holes, perhaps weep-holes, situated 6 ft. apart from each other.

The Period was divisible into four Sub-periods, during two of which there was a considerable building activity. The Northern Black Polished Ware was met with for the first time in the latest Sub-period, the earlier Sub-periods being associated with plain red and grey wares. The packing against the revetment of the Period also yielded a few red-ware sherds, seemingly exotic to the usual range of the ceramics of Kausambi.

Period II marked an appreciable change in the plan, the defences being raised by at least 16 ft. and widened on the east by 28 ft. The extended portion was revetted on the northern and southern sides by brick facings and on the eastern side by a curved brick wall. The junction of the southern revetment and the curved wall was found disturbed, but at the northern junction there were traces of guard-rooms. The northern revetment was available to a length and height of 40 ft. 3 in. and 19 ft. respectively and was battered back to 30°. At its western end there was an oblong bastion, 4 ft. 6 in. x 9 ft. 6 in. (pl. LXI B). The southern revetment had mostly collapsed (pl. LXI A).

The curved wall had the lengths of 63 ft. 6 in. and 67 ft. 10 in. respectively on the inner and outer (city) sides of the curve. Having an overall width of 6 ft. 10 in., it encased a stone-paved drain (or passage), 6 ft. 10 in. deep and 1 ft. 9 in. wide (pl. LXIIIB). The drain had a corbelled arch finally capped with widthwise-laid bricks (pl. LXIV B). There was also a 2-ft. square man-hole about the middle of the extant length. At each end of the drain was a pair of slits into which planks may have been inserted.

Throughout this Period, with its four Sub-periods, the N. B. P. Ware was found in abundance.

During Period III, which had two Sub-periods, the defences were further extended by 25 ft. on the eastern side. The brick revetment, available to a length of 54 ft., had a batter of 20° (pl. LXI B). Towards the city-side were added several guard-rooms flanked by a tower each on the northern and southern sides, access to which was had by a flight of steps. The walls, running from the guard-rooms to the rampart, provided a passage 16 ft. 7 in. wide .(pl. LXII).

An interesting discovery of this Period was that of a *syena-chiti* ('eagle-altar') associated with *purushamedha* (human sacrifice) described below (pp. 48 and 49).

Coins of Mitra kings were found during both the Sub-periods, while the second Sub-period marked the upper limit of the N. B. P. Ware. The Period ended with an extensive conflagration and destruction on a large scale perhaps indicating an invasion.

As would be clear from the above, the defences showed certain outstanding constructional features: they were of mud with a battered burnt-brick revetment, built according to the English brick-bond system; the roof of the drain (or passage) was corbelled. If one has to look for parallels at other ancient sites in India, one is reminded of Harappa and Mohenjo-daro, even though it would be difficult to say if at all and through what process these sites might have influenced Kausambi.

Period IV, with three Sub-periods, marked some changes in the alignment of the walls, but the general lay-out remained unaltered.

Amongst the structures of Period V, divisible into six Sub-periods, particular mention may be made of the guard-rooms and flights of steps (pl. LXII). The last Sub-period witnessed destruction on an unparalleled scale: the entire area was burnt down and the buildings were almost razed to the ground.

The excavation yielded a large number of minor antiquities, amongst which particular mention may be made of terracottas (pl. LXVII A), the more important of which were human heads in the grey ware and N. B. P. Ware, and arrow-heads of bone and iron (pl. LXVII B). The chief types of the latter were as follows: leaf-shaped with a single or double tang; with curved blades; with three blades; four-flanged with rhomboid or square cross-sections; conical; socketed; barbed; leaf-shaped with two curved hooks near the junction of the blade and the tang; and with projected point flanked by three-bladed hooks. The first-named type went back to the levels of the N. B. P. Ware, while the others were found variously in the later levels, this dating evidence being in general agreement with that found by Marshall at Taxila.

On the basis of the associated pottery, coins and terracottas, the beginnings of the different Periods of the defences may be dated as follows: Period I, *circa* 700 B.C.; Period II, 500 B.C; Period III, 200B.C; Period IV, 50 B. C; and Period V, A. D. 150.

Owing to its special importance, the *syena-chiti,* referred to above (p. 47), may be described here in some detail (pls. LXIII A, LXIV A, LXV and LXVI).

Situated in an enclosure formed by the revetment of Period III and its return-wall, the altar represented the form of a bird flying towards the north-east. The following main stages in the building of the altar were noticed. First, a circular pit, 6 to 7 ft. in diameter, was dug at the would-be junction of the body and the tail of the bird. Containing ashes, the pit may be identified with the original *garhapatya-hearth.* The second stage was the preparation of the ground, a 4-in. thick gritty layer, for the construction of the body. In the third stage a central square of earth *(uttara-vedi),* about 6 ft. high, was raised and the "ground' *(sthandila)* built up (pl. LXV B). The surrounding area around was levelled up by packing, in which clods of bricks were also used. Lastly, through various stages, the body and wings were put up on the levelled ground.

The available evidence revealed that the tail and head had been built separately, the procedure followed here agreeing more with the one prescribed in the *Apastamba Sulba-sutras* 4han with that in the *Satapatha Brahmana,* wherein the building of the head is not mentioned. On the fringes of the wing, body and tail there, were bones, this being, however, in accordance with the *Satapatha Brahmana.*

Of the body, four layers of bricks, separated from one another by a layer of specially-prepared mud-mortar, were revealed. In a small corner there were traces of a fifth layer, destroyed by a subsequent pit. Of the head only one course of bricks

was left. The left wing had sunk and the hind part of the body and a portion of the tail washed away.

Near the right wing there were two platforms, measuring 6 ft. x 3 ft. 9 in. and 3 ft. 3 in x 2 ft. 6 in. respectively, which may be identified with the *marjaliya-platforms* of the texts. Behind the tail was another large platform, measuring 13 ft. 8 in. x 8 ft., which may be identified with the *sadas,* the seat of certain priests and respectable Brahmanas.

The body was elliptical on plan,, the maximum length and width being 197ft. 6 in. and 13 ft. respectively. The neck, head and beak measured 7 ft. 9 in. along the spine. The total width of the altar, inclusive of the two wings, was 32 ft. 6 in.

The details of the different layers of the body were as follows. In the lowermost layer in the centre *of* the altar, there Jay a small *kankar-nodule* wirh-a. spongy surface (the textual *svayamatrina),* enclosed by a circle of bricks (pl. LXVI A). A fire-pan *(ukha)* was placed on a small brick platform at the distance of 1 ft. 6 in. (1 *aratni* of the texts) towards the north-east from the centre (pl. LXV B). A terracotta female figurine (pl. LXVII A, 6), stylistically ascribable to *circa* second century B. C, was found near the *ukha.*

A number of animal-bones bearing incision-marks and a tortoise-shell were found in this layer. A human skull with a number of jars (pl. LXVI B) was found on the tail in a layer contiguous with the first layer of the body.

On the basis of their shape, size, colour, special marks and position on the plan, many of the bricks in the layer, as also of the following ones, were identifiable with those mentioned in the texts.

Separated from the preceding layer by a thin deposit of sand, the second layer yielded five animal-bones, of which one, the lower jaw of the *Bos namadicus,* enclosed by twenty special bricks, was placed in the centre of the body. It is significant that the *Satapatha Brahmana* makes frequent references *to* animals in connexion with the *chhandasya* bricks of this layer.

From the third layer, between which and the preceding one there intervened a thin deposit of mud, as many as one hundred and sixtytwo bones and bone-fragments were recovered. Of these, the following were tentatively identified : three human skulls, eleven fragments of human skull, five lower human jaws, nine human ribs, five human pelvic bones, six animal-ribs and two animal-jaws. The human skulls were enclosed with bricks. A 4 1/2-in. thick deposit of compact mud sealed the layer.

From the uppermost layer, destroyed *to* a considerable extent by a subsequent pit, thrityeight bones, including fragments, were recovered.

The available evidence indicated a date in the second century B. C. for this altar associated with the *purushamedha.* And if one looks back to the *Satapatha Brahmana* regarding the significance of this sacrifice, one may perhaps hazard a guess that the founder of the Mitra dynasty may have performed it in order to commemorate the establishment of his political authority.

29. EXCAVATION AT JAJMAU, DISTRICT KANPUR.—The Department of Archaeology, Government of Uttar Pradesh, under Shri M. M. Nagar, continued excavation at Jajmau *(1956-57,* p. 29). The antiquities exhumed during the season included a few sherds of the grey ware, a large quantity of the Northern Black Polished Ware, iron implements, ivory bangles, dice, terracotta figurines and weights, etc. Of the terracotta figurines, particular interest attached to one with applied head-dress and ears, pinched nose and slit eyes, associated with the grey ware.

30. EXCAVATION AT RAJGHAT (VARANASI).—The Banaras Hindu University, with Dr. A. K. Narain as the Director, carried out an excavation at Rajghat, which not only confirmed the observations made during the salvage-excavations at the site in 1940 but also brought to light fresh material of importance. It may be recalled that the site was brought to the notice of archaeologists as a result of the digging operations carried out in the area for railway-constructions.

Situated on the north-eastern outskirts of the city of Varanasi (Banaras), Rajghat is an extensive tableland rising about 60 ft. above the surrounding ground-level. It is enclosed on the north and north-east by the river Barna, on the west and north-west by a steep depression said to be an old bed of the Baraa and on the south-east by the Ganga. The remains of a rampart with gates are noticeable. That the site represents ancient Varanasi was clearly demonstrated by the discovery, during the 1940-excavation, of a sealing inscribed in Gupta characters with *Baranasy-adhishthan-adhikara-naysa,* i. e. '(the seal) of the city-administration of Baranasi'.

For various reasons, the area falling in the premises of the tomb of Lai Khan, a medieval monument standing on-a part of the site, was selected for excavation, though a major portion of the area had already been disturbed by the railway-diggings down to a depth of about 20 ft. (in which portion the salvage-operations were carried out subsequently).

This year's excavation brought to light six Periods of human occupation, rang-ing in date from *circa* sixth-fifth century B. c. to seventeenth century A. D., besides the semi-fossilized remains of a mammal, lying embedded in the natural soil at a depth . of about 55 ft. from the surface. The more important features of the different Periods, from bottom upwards, were as follows.

Period I *(circa* sixth to third century B. c.) was characterized by the presence of the Northern Black Polished Ware in coal-black, golden and steel-Blue shades and sherds of plain grey, unslipped red and black-and-red wares. Mention may also be made of two sherds with a dull-black interior and ashy grey exterior, bearing black and orange-red bands. No structures of this Period were found. The other small finds included twenty beads of terracotta, glass, stone and copper and few terracotta human and animal figurines.

Of Period II *(circa* second century B. C. to first century A. D), a long drain, a terracotta ring-well and the remains of a few walls were found, the size of the brjcks being 1 ft. 7 in. x 11 in. x 2 in. The N. B. P. Ware continued in use as in the preceding Period, but the plain grey ware occurred only sporadically. The other finds included six terracotta seals, five bearing the name of Revatimita in letters of the second-first century B. c. and one of Pushamita or Agamita in letters of the first century A. D., uninscribed cast copper coins, a broken terracotta plaque and thirtynine beads, variously of stone, glass and terracotta.

Belonging to Period III *(circa* second to fourth century A. D.) were the remains of several walls, but on account of the limited extent of the excavation definite plans were not made out. The pottery included a thick red ware bearing the designs of wheel, lotus, sun, etc. (pl. LXIX B). A particularly interesting specimen had a stamped design showing a railing with three flag-staffs surmounted respectively by a hollow cross, a *triratna* and the *dharma-chakra.* Mention may also be made of a broken terracotta votive tank showing a ladder and another unidentified object. A seal, bearing the design of a couchant humped bull and the inscription *pushkarana* or *pushkarata* in characters of second-third century A. D., some round copper coins and beads of terracotta stone and glass were among the other finds of the Period.

Ascribable to Period IV {*circa* fifth to eighth century A. D.) were a few walls and two square *kundas* with the sides tapering downwards (pl. LXV1II). While the red ware occupied the dominant place, sherds of a black ware were also found. Parti cularly noteworthy were the shapes of the spouts (pl. LXIX A) and terracotta sprinklers. A few steatite pots of milky colour and a few specimens of a glazed ware were also recorded. The other small finds comprised fine terracotta animal and human figurines (pl. LXX), a stone head of Buddha, two seals bearing respectively the names of Bhadra-svami and Samudradatta, round copper coins and thirtyone beads of different materials.

An interesting discovery was that of small lidded earthen jars containing charred human bones, grains and cowries, pointing to the practice of post-cremation burial during the Period.

During Period V (*circa* ninth to fourteenth century A. D.) were found some flimsy remains pf walls, a well and a number of fallen architectural fragments including *sikharas, amalakas,* jambs and lintels, some being carved with decorative patterns. A medieval Hindu coin '(?), a number of terracottas and beads and a fragmentary stone sculpture were among the other finds of the Period.

Period VI (*circa* fourteenth to seventeenth century A. p.) was characterized by glazed and red wares and the use of *lakhauri* bricks for buildings. Amongst, the small finds, mention may be made of two coins, one each of the Suri king Islam Shah and Akbar, a small stone image of Ganesa and polychrome glass bangles.

WEST BENGAL

31. EXCAVATION AT CHANDRAKETUGARH, DISTRICT 24-PARGANAS— The University of CSlcutta, under Shri K. G. Goswami, resumed the excavation at Chandra-ketugarh (*1956-57,* p. 29): besides continuing work in the last year's trench to the west of the Berachampa-Haroa road, excavation was done on a 14-ft. high mound, locally known as Khana-Mihirer Dhipi, situated to the north of the Baraset-Basirhat road.

The drain of pottery-pipes, partly exposed last year, was further excavated (pl. LXXI), and it was noticed that it had a definite slope towards the east. As noted before, the site witnessed five successive occupational Periods, the earliest of them characterized by the use of a red ware, in the shape of the long-necked jar, big rimless round cup and bowl, etc. (fig. 24), and ivory beads and bangles. The pottery of the later Periods (fig. 24) comprised the dish and bowl of grey ware with stamped designs at the centre of the base, cup and dish in the Northern Black Polished Ware, bowl of both black and red wares, with wide mouth, incurved rim, short beak-like spout, and dish of the Rouletted Ware (pl. LXXII). The other antiquities included beads of different semi-precious stones, antimony-rods of copper and ivory, a copper punch-marked coin, bearing the symbols of an elephant, fish-in-pond and sun-and-wheel, and a two-legged armless terracotta figurine, probably a serpent-deity, having pinched head, round eyes, five horizontal lines, one on throat and two below, and rows of circles indented on the body (pl. LXXIII A).

The excavation in the Khana-Mihirer Dhipi area brought to light the western wall of-a stupendous polygonal brick structure, probably of the Gupta period. Available to a height of 14 ft. 6 in., the wall was 6 ft. 8 in. and 4 ft. wide respectively at the bottom and top. Starting from the northernmost exposed point, it was found to run in the following order, the turns being always at right angles: southwards, 45 ft.; westwards, 8 ft. 6 in.; southwards, 24 ft. 9 in.; westwards, 1 ft. 1 in.; southwards 14 ft.

6 in.; eastwards, 1 ft. 1 in.; and southwards (full length not exposed). Although the building could not be fully laid bare, the re-entrant angles suggested that it had been one of the *sarvato-bhadra* type, probably a temple. With bricks of different sizes, the structure was repaired and renovated on later occasions, decorative bricks being sometimes used in place of ordinary ones.

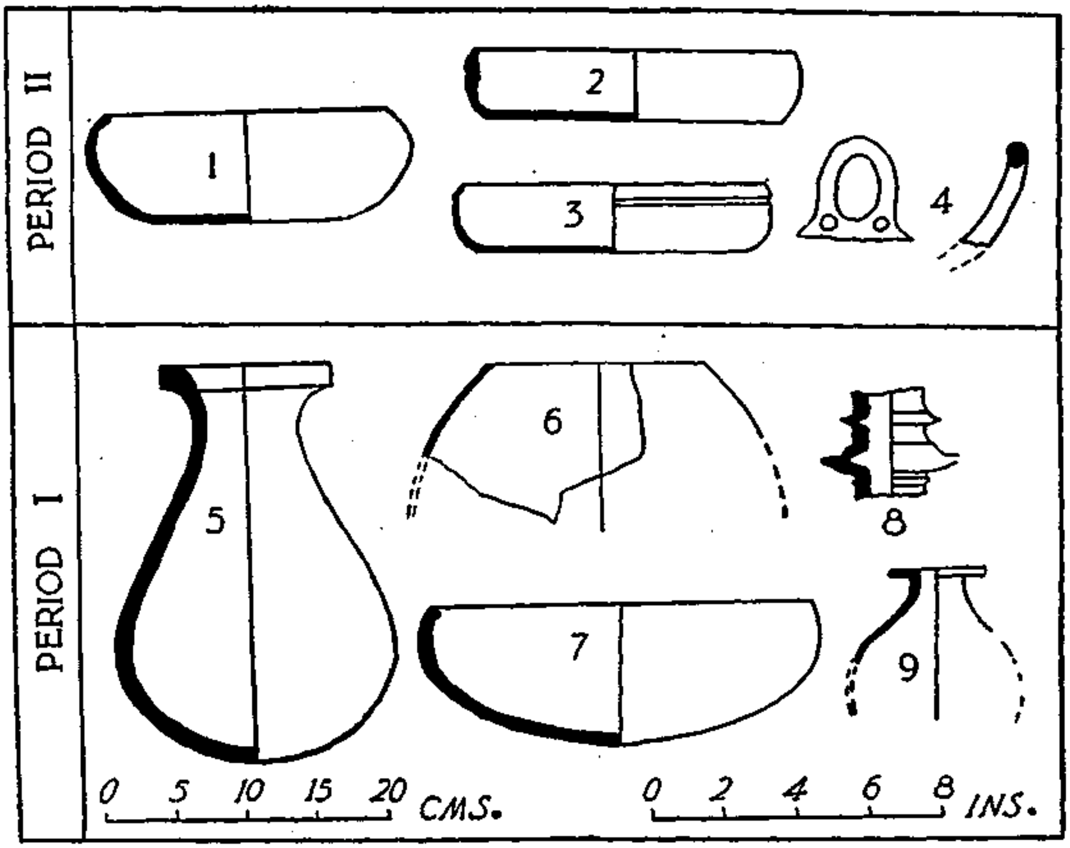


FIG. 24. ***Chandraketugarh: pottery***

On the basis of the finds, the occupation in the area was divisible into six Periods, numbered I to VI from bottom upwards.

During Period I, which was earlier than the temple and may be assigned to the pre-Gupta age, tiles were used for house-building on mud-plinth. The pottery (fig. 25) included the cooking pan with ring-handle and jar with high neck and everted rim in grey ware and vase, dish, bowl, cooking vessel and big jar with basket-design in red ware.

Of the early Gupta age, Period II yielded a few cast copper coins and terra-cotta plaques containing couples or *mithunas* (pi. LXXIII B and C).

The pottery of Period III (fig. 25) included: the dish with incurved rim, bowl with tapering sides, casket with concave base and incurved rim designed to hold the lid, large cylindrical jar with horizontal grooves on the exterior and a potsherd with stamped leaf-design arid another with rosette-design, all of grey ware; the Rouletted Ware (pi. LXXII) and sherds of black-and-red ware decorated on the interior just below the rim with a row of stamped medallions with a bird-motif within a square panel (pi. LXXII, *6).*

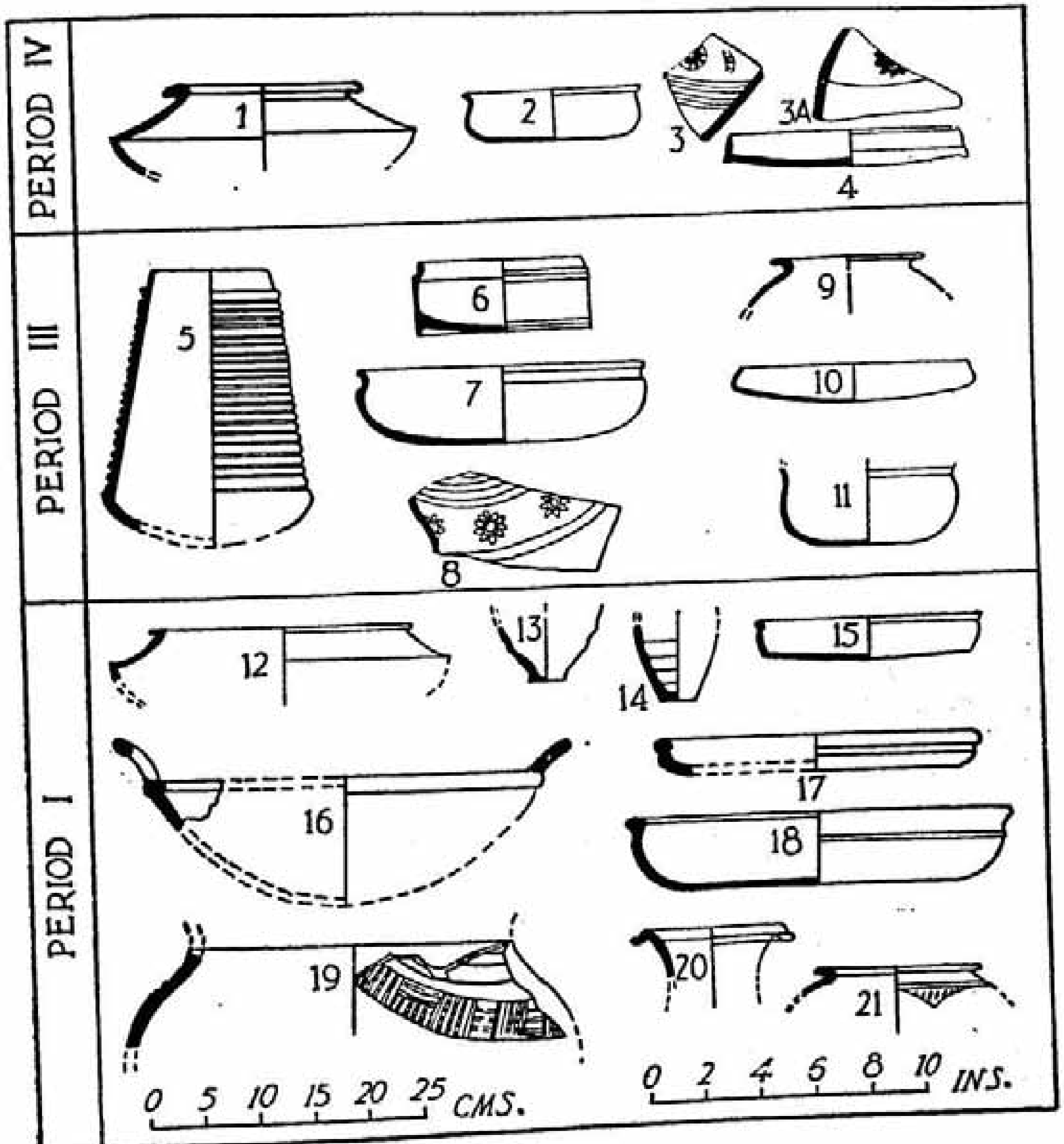


FIG. 25. *Chandraketugarh: pottery*

Noteworthy in the pottery of Period IV were the carinated and flanged cooking vessel and bowl of red ware. There were potsherds of grey ware with stamped wheel- and rosette-designs.

During Period V (probably assignable to the Pala age) the upper part of the massive wall was renovated with rubbed bricks.

During Period VI, the remains of a few structures were noted.

III. EPIGRAPHY

SANSKRITIC AND DRAVIDIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. SANSKRIT INSCRIPTIONS, NAGARJUNAKONDA, DISTRICT GUNTUR.—One of the inscriptions records, in six different versions, the erection of a temple by *talava* Elisri, son of Gandi and grandson of *senapati* Anikki, in the eleventh year of the rule of Ehuvalasri. Another epigraph, engraved on a pillar, refers to the construction of a temple of the god Pushpabhadra and the erection of a *dhvaja-stambha* in front of it in the sixteenth year of Ehuvala-Chantamula by his son Purushadatta.

2. PRAKRIT INSCRIPTION, JAGGAYYAPETA, DISTRICT KRISHNA.—The epigraph is in Prakrit language and in Brahmi characters of about the second or third century A. D. It records the gift of a coping stone, apparently meant for the railings of the *stupa* that existed at the place.

3. YADAVA INSCRIPTION, KADIVELLA, DISTRICT KURNOOL.—Engraved on a huge rock, the inscription records a grant of land made by Kandarasa, a subordinate of the Yadava king Ramadeva, in the cyclic year Sarvajit, corresponding to the king's seventeenth regnal year (A. D. 1287).

4. EARLY CHALUKYA GRANT, AMUDALAPADU, DISTRICT MAHBUBNAGAR.—The plate records the grant of Iparumkal in Vamguravadi-*vishaya* by king Vikramaditya I in his fifth regnal year, A. D. 660, when he was camping at Marrura, in favour of Sudarsanacharya as *gum-dakshina* on the occasion of the king's *Siva-mandala-diksha.*

5. WESTERN CHALUKYA INSCRIPTION, AINAVOLU, DISTRICT WARANGAL.—Dated in the Chalukya-Vikrama year 43 (A. D. 1118) in the reign of Tribhuvanamalla Vikramaditya VI, the epigraph records the gift of lands by *dandanayaka* Surayya for the worship of and offerings to the god Suresvaradeva of Ayyanavolalu and for the feeding of ascetics.

6. INSCRIPTION OF RECHARLA ANAVOTA, AINAVOLU, DISTRICT WARANGAL.—Dated in Saka 1291 (A. D. 1369), the record furnishes the genealogy of the Recharla family commencing with Vennaya and records the grant of the village Ayyanavrolu to the god Mailaradeva by Anavota, son of Singama-nayaka.

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[1] Except nos. 14, 15, 22, 26 and 28, all have been reported on by the Government Epigraphist for India out of about thirty copper plates and three hundred and fifty stone inscriptions examined by him during the year. Nos. 14, 15 and 28 have been respectively noticed by the Superintendents, South-western, Western and Eastern Circles of the Department, no. 22 by the Officer on Special Duty, Department of Archaeology, Madhya Bharat State, and no. 25 by the Director of Archaeology, Mysore State.

7. INSCRIPTION OF RECHARLA-RUDRA, ELKURTI, DISTRICT WARANGAL.— The inscription records the construction of four temples for the gods, Rudresvara, Anyesvara, Lokesvara and Ganesvara, by Rudra, who seems to have flourished in the early half of the twelfth century.

8. KAKATIYA INSCRIPTIONS, HANAMKONDA, DISTRICT WARANGAL.—The earliest of the records mentions the Kakatiya ruler Beta II as the son of Prola and grandson of Beta I of Durjaya-kula and as a subordinate of the Western Chalukya king Tribhuvanamalla. Two other epigraphs belong to the time of JProla II, son of Tribhuyanamalla and grandson of Beta II. Another inscription of the time of Rudra, son and successor of Prola II, mentions Gangadhara, who took up service under the father and rose to the position of the chief minister under the son.

9. WESTERN CHALUKYA INSCRIPTION, PUNYAVOLU, DISTRICT WARANGAL.— The epigraph, belonging to the rule of Irivabedangadeva and dated Saka 929 (wrongly written as 939) and Plavanga (A. D. 1007), records the gift of lands in the villages of Ayyanvolalu and Bilvola as *pannasa* to Kesanamayya of the Vaji-kula by Arasapayya, the *tantrapala* and *angaraksha* of the king.

10. INSCRIPTION OF THE POET NARASIMHA, WARANGAL.—Four short Sanskrit inscriptions in the fort at Warangal speak of the poet Narasimha. One of them refers to the poet's ten *rupakas* and his prose-work entitled *Malayavati.* The other works of the poet referred to in these inscriptions are the *Kakatiya-charita* in eight cantos, which he claims to have completed in a single day, and a commentary on the *Rigveda.* In one of the inscriptions, the poet describes the elephants of the Kakatiya king Pratapa-rudra, who seems to have been his patron.

11, GAJAPATI INSCRIPTIONS, WARANGAL.—The two epigraphs are engraved on the eastern and western gates of the fort at Warangal and refer to the capture of the fort by the Gajapati army. The one on the western gate belongs to Virabhadra Raghudeva, son of Parasurama, who was the younger brother of the Gajapati Kapilesvara and the son of Jagesvara. The record is dated in the Kali year 4561, Pramathin (A. D. 1460), and states that Warangal lay within the dominions of Humayun Shah, Sultan of Kalubarega (Gulbarga). The other inscription, set up about the same time, on the eastern gate mentions prince Hamvira-mahapatra, son of Kapilesa Gajapati, and states that he captured the fort.

BIHAR

12. INSCRIPTIONS, GAYA.—One of the inscriptions mentions king Prataparudra and records that Gauri, the wife of the king's preceptor Mallikarjuna, performed her husband's *sraddha* at Gaya. This Mallikarjuna may be identical with the great Saiva teacher Mallikarjuna-panditaradhya and Prataparudra with the Kakatiya king Prataparudra I, also called Rudra (A. D. 1163-95). Another inscription mentions Appana, a priest of the Hoysala king Vira-Narasimha, and records the e'stablishment of a *matha* by the former for the use of the pilgrims who visited Gaya. Two other inscriptions mention the Vijayanagara king Krishnadevaraya and his successor Achyutaraya. Krishnadevaraya's epigraph, dated Saka 1444 (A. D. 1521), records the setting up of the king's *vijaya-sasana* and mentions the poet Mukku-Timmana, one of his court-poets, as the author of the *sasana* . The record further quotes a verse from the poet's

Parijatapaharnamu. The fourth inscription is dated in the Salivahana-Saka (a mistake for Vikrama-*samvat)* 1588, Vikarin (A. D. 1531), and states that it was a *dharmasasgna* of king Achyutaraya. A person named Timmananna performed the *sraddha* of the kings of Vijayanagara at Gaya, apparently on behalf of Achyutaraya.

BOMBAY

13. YADAVA GRANTS, DEVALALI, DISTRICT AHMADNAGAR.—The plates, now in the possession of the Bharata Itihasa Samsodhaka Mandala, Poona, belong to the reign of Bhillama III. The record, dated Saka 974 (A. D. 1052), registers the gift of certain villages in favour of the Brahmana general Sridhara-dandanayaka, whose great-grandfather served under the Paramara Vairisimha of Dhara. The same document contains another grant of Yadava Seunachandra, ther gift-land being stated to have been situated in the territory of Chalukya Trailokyamalla *alias* Ahavamalladeva.

14. IMAGE-INSCRIPTION, AJANTA, DISTRICT AURANGABAD.—A damaged Sanskrit dedicatory inscription in box-headed characters of the fifth century was noticed on the pedestal of the Buddha image in Cave 4. The inscription helps in ascribing the cave to the Vakataka period.

15. CHAULUKYA CHARTER FROM CHANCHVEL, DISTRICT BROACH.—A set of copper-plates of a Chaulukya ruler Trilochanapala, dated Saka 972 (A. D. 1050-51), records the grant of the village Kermatapura by *mahamandalesvara* Trilochanapala.

16. SENDRAKA CHARTER, MEHUNABARE, DISTRICT EAST KHANDESH.—The plates, now in the possession of the Bharata Itihasa Samsodhaka Mandala, Poona, records the grant of a village by Vairadeva, son of Dandiraja and grandson of Devasakti, in Saka 624 (A. D. 702).

17. VAKATAKA GRANT, PANDHURNA, DISTRICT NAGPUR.—The plates, impressions of which were received from the Temple-survey Project, Northern Region, record a grant of land by king Pravarasena II in the twentyninth year of his reign.

18. RASHTRAKUTA CHARTER, KHAKURDI, DISTRICT NASIK.—The plates, now in the possession of the Deccan College Post-graduate and Research Institute, Poona, register the grant of land made by a ruler named Dantidurga in favour of a Brahmana in the cyclic year Tarana, probably corresponding to A. D. 1044.

MADRAS

19. SHORE TEMPLE INSCRIPTION, MAHABALIPURAM, DISTRICT CHINGLEPUT.—A label-inscription on one of the lintels of the temple reads *ekavira,* engraved in Pallava-Grantha characters assignable to the seventh century.

MADHYA PRADESH

20. PLATES OF INDRARAJA, MALGA, DISTRICT BILASPUR.-The charter was issued by *samanta* Indraraja from Mandaka in the eleventh year of his rule.

21. PLATES OF JAYARAJA OF SARABHAPURA, MALLAR, DISTRICT, BILASPUR.—The plates record the grant of a village by Jayaraja in the fifth year of his rule.

22. PLATE OF NARENDRA OF SARABHAPURA, KURUD, DISTRICT RAIPUR.—The charter, belonging to the twentyfourth year ofNarendra, an early Sarabhapura ruler, records the confirmation of a grant made by his father to the son of the original donee, as the original charter, written on *tala*-leaves, had been destroyed by fire.

MYSORE

23. LABEL-RECORDS, AIHOLE, DISTRICT BUAPUR.—Several label-records in Chalukyan characters, assignable to the seventh century, were found engraved- on the pillars of a temple, some of them containing names like Anandasthavira, Maureyan, Bisadan, etc.

24. WESTERN CHALUKYA INSCRIPTION, CHIKKERUR, DISTRICT DHARWAR.—The inscription, dated Saka917(A.D. 995), refers to *mahamandalesvara* Ahavamalla's march against Uppala. The *mahamandalesvara* may be identified with Irivabedanga Satya-sraya, the son and successor of Taila II, and his adversary Uppala with the Paramara king Utpalaraja (Vakpati Munja). The Paramara king's death must have taken place some time after the date of this epigraph.

25. CHALUKYA RECORDS, BANNIGOL, DISTRICT RAICHUR.—The inscription, dated Saka 947 (A.D. 1025), mentions Vijayaditya Trailokyamalla as ruling from Maraga-nur. He may be the Eastern Chalukya prince Vijayaditya, who was the step-brother of Rajaraja and sought Western Chalukya aid in his dispute for the throne of Vengi. Another inscription of the time of Trailokyamalla Somesvara mentions Revakabbarasi, wife of *dandanayaka* Vavanarasa, as holding the office of *mahapasayite* and governing over Bannigola.

26. MISCELLANEOUS INSCRIPTIONS.—A fine *Ganga. viragal* belonging to about the ninth century and mentioning Nagattara, a Ganga chief, was discovered. A Hoysala inscription discovered on a hill in District Chitaldrug belongs to the reign of the Hoy-sala king Narasimha II. It commemorates the construction of a temple at the place by Machideva, a subordinate of the Hoysalas. The temple stands in front of a large cave which houses a *linga.* Yet another inscription belonging to the Hoysala king Ballala III, discovered at Hanchikuppe, Bangalore District, is important in view of the fact that it confirms that Ballala III was wandering from place to place during his last days, as it mentions Mallipattana as the place of the king's residence. The votive in-scriptions discovered at Tirthahalli are important in so far as they furnish the names of a number of devotees many of whom were under the service of the Keladi queen Chan-nammaji and other *nayaks* or *palaigars* of various other places like Billigi, Harathi and Tarikere.

ORISSA

27. EASTERN GANGA INSCRIPTION, SONPUR, DISTRICT BOLANGIR.—The inscrip-tion, which is dated in the seventh *anka*-year of Vira-Bhanudeva, testifies to the inclusion of the area around Sonpur in the dominions by the Imperial Gangas about the thirteenth century.

28. SOMAVAMSI CHARTER, RATNAGIRI, DISTRICT CUTTACK.-An incomplete Set of copper-plates of the Somavamsi ruler Karnnadeva records the grant of a village in the sixth year of his reign. This ruler is evidently the same as is mentioned in the commentary on the *Ramacharita* as king of Utkala.

29. EASTERN GANGA RECORDS, KAPILAS, DISTRICT DHENKANAL.—These epigraphs show that the temple of Kailasasikharesvara on the Kapilas hill was built by king Narasimha I {*circa* A.D. 1239-64).

30. EASTERN GANGA INSCRIPTION, PURI.—Three inscriptions on the walls of the Markandesvara temple at Puri are dated respectively in the thirtyseventh regnal year of Anantavarman Chodaganga (A.D. 1078-1147), the third *anka-year* of Raghava (*circa* 1156-70) and the fourteenth *anka*-year Bhanu (I or II).

RAJASTHAN

31. CHARTER OF DEVAPALA, BHINMAL, DISTRICT JALOR.—It is a single plate engraved in latd characters and records a grant of *maharajadhiraja* Devapala, son of Kanhardeva.

32. CHAHAMANA INSCRIPTION, JALOR.—Dated in the Vikrama year 1331 (A. D. 1274), this inscription of the *maharajakula* Ghachigadeva of the Jalor branch of the Chahamana dynasty registers certain grants to the god Mahavira in the Chandana-*vihara* of the Jaina monastery attached to the Nanakiya-*gachchha* on the occasion of the *ashtahnika* festival.

UTTAR PRADESH

33. INSCRIPTIONS OF THE GAHADAVALAS.—A copper-plate, now preserved in the Allahabad Municipal Museum, records a grant of the Gahadavala king Govinda-chandta issued in the Vikrama year 1171 (A. D. 1115). A later Gahadavala king named Avadakkamalla is mentioned in a Kausambi inscription of the Vikrama year 1294 (A.D. 1238).

ARABIC AND PERSIAN INSCRIPTIONS[1]

ANDHRA PRADESH

1. MISCELLANEOUS INSCRIPTIONS, HYDERABAD.—An inscription from Hyderabad, dated A.H. 1167 (A.D. 1153-54), mentions the death of the Sufi saint Khwaja Islam Khan Naqshbandi. Another records the construction of the tomb of a saint named Da'ud, son of Husain, by Khwaja Wahhab. It is dated A. H. 771 (A. D. 1369-70).

[1] All have been reported on by the Assistant Superintendent for Arabic and Persian Inscriptions of the Department.

BOMBAY

2. INSCRIPTIONS OF MUHAMMAD BIN TUGHLUQ.—An inscription from Daulatabad, District Aurangabad, records the construction of a mosque during the reign of Muhammad bin Tughluq at the instance of Maliku'l Nasiru'l Mulk, on the fourteenth Rabi I, A. H. 733 (3rd December 1332). Another record of Muhammad bin Tughluq, from the same place, records the construction of a step-well in A. H. 722 (A. D. 1322).

3. INSCRIPTION OF THE BAHMANI DYNASTY—Another important inscription from Daulatabad refers to the construction of a minaret during the reign of 'Ahmad Shah II in A. H. 849 (A. D. 1445-46) by one Parwiz Abd-i-Sultani, who was dignified with the status of *mahi-o-maratib,* given only to persons of the highest rank.

MYSORE

4. INSCRIPTIONS OF THE 'ADIL-SHAHIS OF BIJAPUR.—A large number of inscriptions belong to the Sultans of the 'Adil-Shahi dynasty of Bijapur, represented by Isma'il, Mallu, 'Ali 'Adil Shah I and Ibrahim 'Adil II. Two of them refer to Ibrahim 'Adil Shah: the first is dated A.H. 1032 (A. D. 1622-23) and records the construction of nine *mihrabs* in a mosque, while the second records the construction of a congregational mosque *(jamV-masjid)* in his reign by 'Abdul Muhammad. One more inscription of the same ruler is important as it records the holy visit of the king to the *dargah* of Hadrat Sayyid Muhammad Hasaini Gaisu Daraz Banda Nawaz, the patron-saint of the south. The inscription is dated A. H. 994 (A. D. 1585-86). Sultan Muhammad Shah is represented by an inscription dated A. H. 1050 (A. D: 1640-41) and recording the construction of the *dargah* of the same saint by 'Ali Rada bin Muhammad Aqa.

IV. NUMISMATICS AND TREASURE-TROVE[1]

ANDHRA PRADESH

1. MUGHUL COINS, SIRKONDA, DISTRICT ADILABAD.—Five hundred and fiftynine coins of the Mughul dynasty were found.

2. SATAVAHANA COINS, PYNA, DISTRICT EAST GODAVARI.—A copper coin of Vasithiputa Siri Chada Sata was found.

3. PAGODAS, GARIKAPADU, DISTRICT GUNTUR—Five coins, appearing to be . issues called the pagodas of Madras, which had originated in the time of Rangaraja, were found. This king, in one of his *kauls* to the East India Company, is stated to have empowered the British to coin pagodas with the image of Chennakesavasvamin and two goddesses. The present coins conform to this in having a deity (Vishnu) flanked by two goddesses and may thus be specimens of this type of pagodas.

4. QUTB-SHAHI COINS, VEMALWADA, DISTRICT KARIMNAGAR.—One copper coin of the Qutb-Shahi dynasty (1657) and six hundred and twentythree coins of the Asaf-Jahi dynasty (1828-1911) were found.

5. VIJAYANAGARA COINS, KAMAGANIKUNTLA, DISTRICT KURNOOL.—Twenty-eight gold Vijayanagara pagodas and eight gold Vijayanagara half-pagodas (1508-30) were found.

6. ASAF-JAHI COINS, BACHARAM, DISTRICT MEDAK.—Twenty machine-made silver coins of the Asaf-Jahi dynasty (1868-1911) were reported.

7. VIRAYA-FANAMS, NORTH AMALUR, DISTRICT NELLORE.—Over three hundred gold coins, identifiable with the well-known *Viraya-fanams,* in circulation in the south-eastern districts in the pre-British period, were found.

8. BAHMANI COINS, BHATALPUDI, DISTRICT VISAKHAPATNAM.—Fifty copper coins of Sultan Kallimullah, the last of the Bahmani rulers, were found.

9. MISCELLANEOUS FINDS, ENTIKONNE, DISTRICT WARANGAL.—Eighteen coins, sixteen neck-stripes, one *copitadu,* three rings, two *patakalus,* eight *latakalus,* five molapalla billalus and four ear-*pugulus*—all of gold and of the period of Shah Jahan (1628-58)—were reported.

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[1] Information from : nos. 1-9, Superintendent, South-eastern Circle of the Department; no. 10, Government Epigraphist for India; nos. 11, 12, 15, 16 and 18-20, Director of Archives, Bombay State; no. 13, Superintendent, South-western Circle of the Department; nos. 14, 17 and 26, Superintendent, Western Circle of the Department; nos. 21-23, Director of Archaeology, Kerala State; no. 24, Director of Archaeology, Mysore State; nos. 25, 30 and 31, Superintendent, Eastern Circle of the Department; and 27-29, Director of Archaeology, Uttar Pradesh State.

BIHAR

10. COIN OF BHAIRAVASIMHA-The coin, struck in Saka 1411 (A. D. 1489-90) corresponding to the fifteenth regnal year of the Oinvar king Bhairavasimha of Tirhut, shows that the ruler ascended the throne in *circa* 1475. The coin is one of the very few known specimens of the Oinvars.

BOMBAY

11. MEDIEVAL COINS, AHMADABAD.—Thirteen silver coins of the Sultans of Gujarat—six of Mahmud I (1458-1511) and the rest of Muzaffar II (1511-1526)-were found.

12. MEDIEVAL COINS, KHOHRA, MAHMADABAD, DISTRICT AHMADABAD.—A hoard of one hundred and one copper coins consisted of the issues of Akbar and Jahangir and 'Ahmad Shah I, Muhammad Shah II and Mahmud I, Sultans of Gujarat, besides worn-out and unidentifiable ones.

13. TUGHLUQ COINS, DAULATABAD AND ELLORA, DISTRICT AURANGABAD.—Two coins of Muhammad Tughluq, one from Daulatabad, of gold-plated copper, and the other from Ellora, of copper, the latter bearing the name *sri-Mohamad* in Nagari characters, were found during clearance-operations.

14. KSHATRAPA COIN, KARWAN, DISTRICT BARODA.—A silver Kshatrapa coin was found.

15. MEDIEVAL COINS, ERANDOL, DISTRICT EAST KHANDESH.—An earthen pot, containing fourteen coins was unearthed. Of the coins, twelve belonged to Mahmud III of Gujarat (1537) and the remaining two to Akbar, one of them dated A. H. 996 and the other Isfandarmuz 42 Ilahi, Tatta mint.

16. GUJARAT COINS, KHERVA, DISTRICT MEHSANA.—Twentyone silver coins, belonging to Muzaffar III, Sultan of Gujarat (1561-1573) and varying in date from A. H. 976 to 980, were discovered.

17. GADHAIYA COINS, MODHERA, DISTRICT MEHSANA.—Two silver and one copper Gadhaiya coins were found within the precincts of the Sun temple in the course of the clearance of debris.

18. COINS OF THE SULTANS OF DELHI, KALEWADI, DISTRICT POONA.—A hoard of one silver and four hundred and fiftysix copper coins and four silver ornaments was discovered. The silver coin was of Muhammad Tughluq and the copper coins variously of Balban, Muhammad II Khilji, Mubarak Khilji and Ghiyathu'd-Din Tughluq.

19. GOLD COINS, WALVE, DISTRICT SOUTH SATARA.—A discovered hoard consisted of twenty gold coins of peculiar types, their weights ranging from 8.05 to 12.2 grains. They can be classified as follows: (i) four V-shaped coins, each hardly quarter-inch long, made of thin gold plate. They bear on the obverse impressions of three different dies, one of which is the figure of an unidentified animal, and another consists of fragmentary legends in Kannada characters of the eleventh century ; (ii) three coins, small round pieces, bearing on one side the figure of an unidentified animal and a double-storeyed south Indian temple with symbols of the sun and moon

on the other; and (iii) thirteen coins, also small and round, with Garuda on the obverse and an ornamental figure, which is like a trident (but which can also be identified as a Vaishnava *tilaka),* on the reverse. The attribution of these coins to any dynasty or ruler is not possible.

20. MUGHUL COINS, KAPURA, DISTRICT SURAT.—A hoard of nine hundred and sixtyseven silver coins, all rupees, except seventytwo, which were half-rupees, was found. The rupees belonged to Aurangzeb (eightyfour, mints Ahmadabad, Bareli, Khambayat and Surat, A. H. 1082), Shah Alam Bahadur (twenty, mints Khambayat, Shahjahanabad and Surat, A. H. 1124), Farrukhsiyar (fiftyeight, mints Ahmadabad, Burhanpur, Gwalior, Junagadh, Mumbai and Surat, A. H. 1125-31), Rafiu'd-Darjat (seven, mints Ahmadabad, Junagarh, Surat and Ujjain, A. H. 1131), Shah Jahan II (twentytwo, mints Ahmadabad, Mumbai and Surat, one mintless, A. H. 1131), Muhammad Shah (fourteen, mints Ahmadabad, Aurangnagar, Burhanpur, Gwalior, Itawa and Khambayat, A. H. 1134 and 1137), and Muhammad Shah (six hundred and eighty-eight, mints Mumbai and Surat, A. H. 1131-43). The half-rupees were variously of Aurangzeb (two, mint Surat A. H. 1094 and 1117), Farrukhsiyar (three, of which one is certain and two doubtful, mint Surat, dates missing) and Muhammad Shah (sixtysix, mints Allahabad and Surat, dates missing).

KERALA

21. BRONZE SCULPTURE, NORTH WYNAAD TALUK, DISTRICT CANNANORE.—A bronze sculpture, 10 in. high, probably depicting a Muslim warrior, was found.

22. VISHNU IMAGE, BADAGARU TALUK, DISTRICT KOZHIKODE.—A granite image of Vishnu, 2 ft. high, was found in the course of excavation for a dam-construction and will be acquired for the Trichur Museum.

23. METAL IMAGES, KUNNHIMANGALAM-AMSON, DISTRICT NORTH MALABAR.—A few brass images, etc., were discovered. Some of them are to be acquired for the Trichur Museum.

MYSORE

24. MISCELLANEOUS FINDS.—Six hoards of coins, the earliest of them going back to the period of the Satavahanas and others belonging mostly to the local rulers, such as Kantirava Narasaraja Wodeyar, Haider and Tipu, and to the East India Company, were found.

ORISSA

25. LATE MUGHUL COIN, BARABATI FORT, CUTTACK.-A silver coin of Muhammad Shah Badshah of the Murshidabad mint, dated A. H. 115(4), was found.

RAJASTHAN

26. EARLY COINS, NAGARI, DISTRICT CHITORGARH.—One hundred and eighteen silver and copper coins were obtained. The identified ones include two silver and

thirtyfour copper punch-marked coins and four Sivi and six silver Western Kshatrapa ones.

UTTAR PRADESH

27. LATE MEDIEVAL COINS, DISTRICT HAMIRPUR.—A hoard contained coins issued in the name of the Durrani king 'Ahmad Shah by one Nawab 'Ahmad 'Ali Khan Bahadur, who is unknown from any other source. The mint-name and date are. missing. The coins throw light on the history during the reign of the later Mughuls.

28. LATE MEDIEVAL COINS, DISTRICT PAURI GARHWAL.—A discovered hoard contained one hundred and ten coins, known as *timashis,* of some local rulers of Garhwal issued in the name of Farrukhsiyar. Their joint authorship indicates the disintegration of the Mughul empire and assumption of autonomy by local rulers, still owing allegiance to the court of Delhi.

29. OTHER HOARDS.—The other hoards discovered in the State mostly contained coins of the Indian States, some of them important on account of the symbols and dates occurring on them.

WEST BENGAL

30. COINS OF THE SULTANS OF BENGAL, NAZIRKHANI, DISTRICT MALDA.—A hoard of thirtysix gold coins, mostly issues of the Sultans of Bengal, was found. Thirteen of them are being acquired for the National Museum.

V. OTHER IMPORTANT DISCOVERIES

ANDHRA PRADESH

1. EARLY HISTORICAL SITE, DISTRICT ANANTAPUR.—Shri M. Venkataramayya found, sherds of the Rouletted Ware at Sasanakota, near Hindupur, a site which had previously yielded the Black-and-red and Russet-coated Painted Wares (*1955-56,* p. 72).

2. PALAEOLITHIC SITES, DISTRICT CUDDAPAH.—Shri M. Venkataramayya collected a large number of palaeoliths from Nandalur (pl. LXXIV A, B and C), lying on a terrace which slopes down to the Cheyyar river near a hill-pass, locally known as Lauja-Kanama. A solitary palaeolith (pl. LXXIV D) was also found within the fort-area at Siddhavattam on the bank of the same river.

3. BUDDHIST REMAINS, DISTRICT KRISHNA.—TWO Buddhist images, assignable to the Ikshvaku period, were discovered at Alluru. These, along with those previously recovered (*1956-57,* p. 81), were removed to the Amaravati Museum.

4. EARLY HISTORICAL SITE, DISTRICT KURNOOL.—Shri M. Venkataramayya found the megalithic Black-and-red Ware at Jonnagiri, near the famous hill containing the Yerragudi Rock-edicts of Asoka.

5. PALAEOLITHIC SITE, DISTRICT MAHBUBNAGAR.—Shri K. M. Srivastava discovered a few palaeolithic tools of Series II on the left bank of the Tungabhadra at Singhvaram, about 2 miles south of Alampur. The tools, made on thick flakes of chert, show prominent bulbs of percussion and high-angled striking platform, sometimes indicating signs of preparation.

6. MEDIEVAL SCULPTURES AND INSCRIPTIONS, DISTRICT MAHBUBNAGAR.—Dr. P. Sreenivasachar discovered a large number of medieval sculptures and inscriptions around Podur. They are being removed to the Alampur Museum.

7. MISCELLANEOUS SCULPTURES AND INSCRIPTIONS, DISTRICT NALGONDA.—Dr. P. Sreenivasachar discovered over seventy sculptures and inscriptions at Yelleswaram, a site on the Krishna river opposite Nagarjunakonda. See also p. 9.

8. EARLY HISTORICAL SITE, DISTRICT SRIKAKULAM.—Shri M. Venkataramayya found sherds of the Rouletted Ware and the megalithic Black-and-red Ware at Mukhalingam on the Vamsadhara river. A Satavahana coin of the early centuries of the Christian era was also picked up from the mound behind the famous temple of Mukhalingesvara.

BIHAR

9. EARLY HISTORICAL SITE, DISTRICT PURNEA.—Shri A. C. Banerji found a pillar resembling an Asokan monolith at Sikligarh.

BOMBAY

10. BUDDHIST CAVES, PITALKHORA, DISTRICT AURANGABAD —During the clearance-operations in the rock-cut caves at Pitalkhora, some unique architectural 'features of the early Buddhist caves at the place were revealed, informs Shri M. N. Deshpande. In front of the great *chaitya* a flight of twelve steps in two stages was exposed, showing on either side of the upper series carved figures of *yakshas* and a winged horse (pl. LXXV A), resembling the sculptures in the caves at Bhaja. From the evidence of the recovered architectural members, it appears that the *chaitya* had a low screen with the entrance at the centre guarded by two *yakshas,* the one to the left having an elaborate head-dress resembling that on the Sunga terracottas (pl. LXXVI B). Of special interest was the figure of a *yaksha* (p. LXXVII), carrying on its head a shallow bowl; the outer side of the right palm bears a Brahmi inscription of the second century B. C, reading *Kanhadasena hiramna-karena kata* ('made by the goldsmith Kanhadasa').

The clearance of debris in front of the *vlhara* also revealed an entrance flanked by *dvara-palas* carrying a spear and a shield (pl. LXXVI). By the side of the door-way in the plinth-area were found six carved elephants (pl. LXXV B).

Noteworthy amongst the loose sculptures and architectural pieces were the sculptured friezes depicting a *Jataka*-story (pl. LXXIX), pilasters depicting *mithunas*

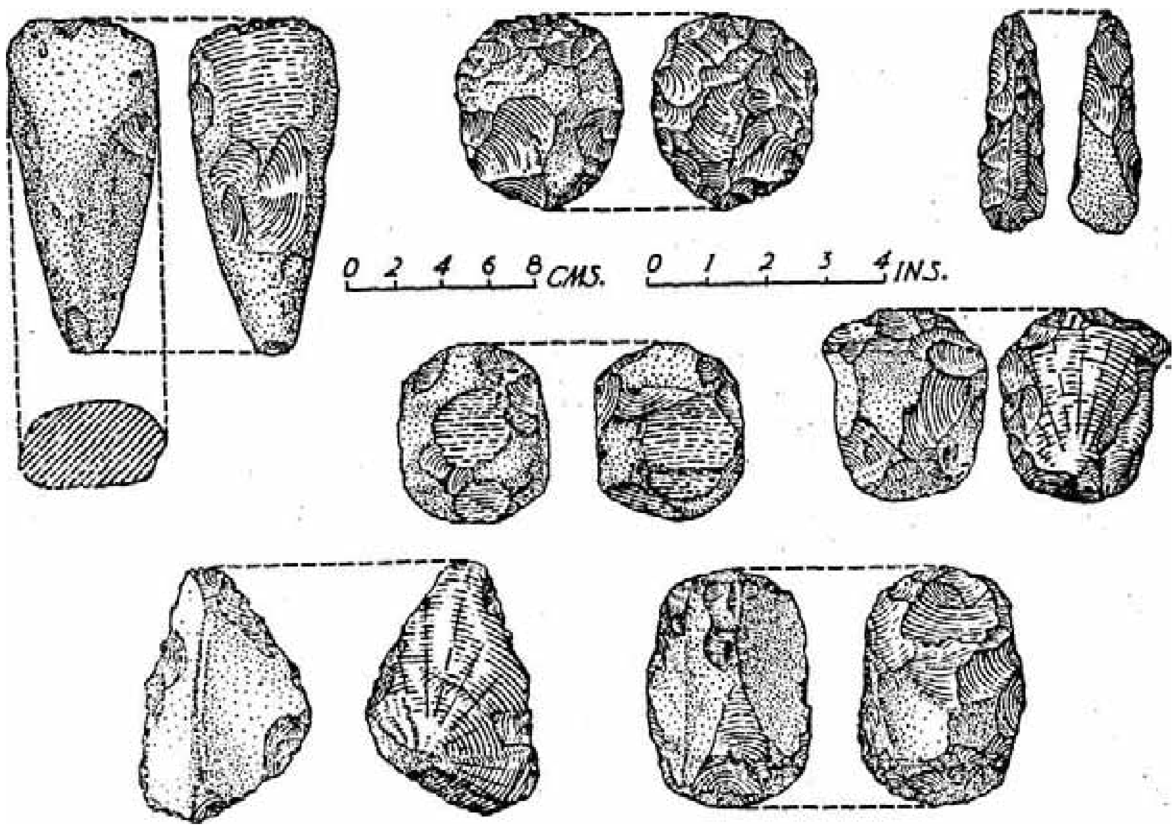


FIG. 26. ***Chandoli: palaeoliths and neoliths***

(pi. LXXVUI A), *dvara-palikas* (p. LXXVIII B) and two miniature crystal *stupas* and a crystal bead turned into a reliquary with two stone stoppers at either end (pi. LXXVIII C).

11. PROTOHISTORIC AND EARLY HISTORICAL SITES, DISTRICT BROACH.—Shri S. R. Rao found the Red Polished Ware of the early historical period at Juni Andhi and Kantyajala and the black-and-red ware, similar to that of Ujjain, at Nagal.

12. PROTOHISTORIC SITES, DISTRICT GOHILWAD.—Shri S. R. Rao discovered a late Harappan site at Akrau, near Bhimnath, and at Pavateswar Mahadev, near Tagadi. The recovered pottery included the dish-on-stand, handled bowl, etc. The former site also yielded chert blades and scrapers of jasper and agate.

13. MICROLiTHIC SITE, DISTRICT JHALAWAR.—Shri S. R. Rao found microliths, including parallel-sided blades and fluted cores, at Sejakpur.

14. PROTOHISTORIC SITE, DISTRICT NASIK.—Following a report from the District Publicity Officer, Shri M. K. Dhavalikar explored the ancient site at Pimpaldar and found on the surface chalcolithic painted pottery of the Nasik-Jorwe complex, including the concave-sided bowl and spouted vessel (pi. LXXX). Noteworthy amongst the painted designs was the motif of the deer with wavy horns. Besides, thick grey ware, similar to that of the earliest levels at Brahmagiri, was also found.

15. BRICK STUPA, DISTRICT OSMANABAD.—Shri B. B. Lai and Shri M. N. Deshpande discovered a 35-ft. high mound, representing a brick *stupa* of the early historical period, at Vadgaon, 16 miles south of Ter, identified with the ancient Tagara. For Ter, see above, p. 23.

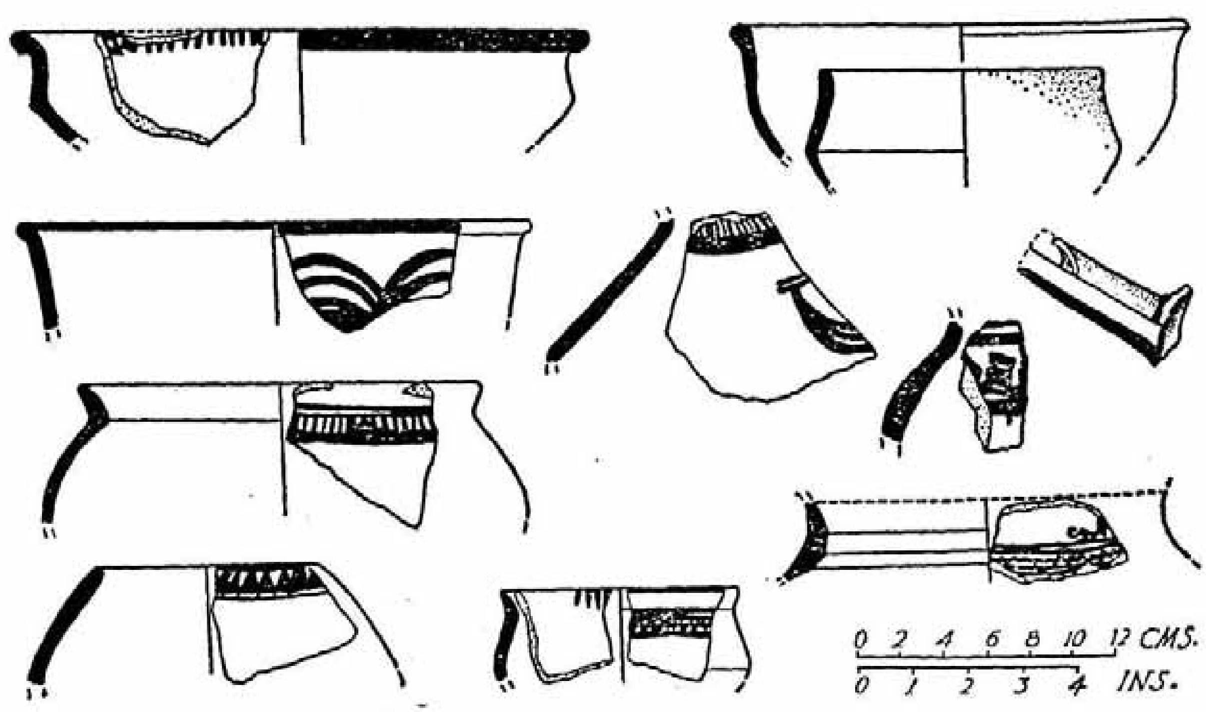


FIG. 27. _ *Chandoli: chalcolithic pottery*

16. EARLY BUDDHIST CAVES, DISTRICT POONA.—Sri R. L. Bhide reported the existence of rock-cut Buddhist caves comprising a *chaitya* and three *viharas* (pl. LXXXI A) in the Bhandara hill, near Induri. These caves, so far unnoticed by antiquarians, are well-known as Vithoba-Rakhumaichi Leni to the local people, who hold them in great reverence on account of their having been frequented by the saint Tukaram.

17. PREHISTORIC AND OTHER SITES, DISTRICT POONA.—Dr. S. B. Deo and Shri Z. A. Ansari discovered a chalcolithic site with polished stone axes and hammer-stones at Chandoli (fig. 26). The recovered pottery was mainly of the Nasik-Jorwe type (fig. 27). Shri Ansari also discovered a few palaeoliths in the river-gravel.

Dr. H. D. Sankalia, Dr. S. B. Deo and Shri Z. A. Ansari examined the mounds at Junnar and found pieces of Roman amphorae.

Dr. H. D. Sankalia, Dr. S. B. Deo and Shri A. P. Khatri discovered a chalcolithic site with the Nevasa-Jorwe pottery and palaeolithic tools of Series II at Karegaon, 16 miles north-east of Poona.

Dr. H. D. Sankalia found a palaeolithic tool of Series I on the left bank of the Mula-Mutha river near the Bund Garden at Poona and several tools of Series II a little upstream in the gravel.

Dr. H. D. Sankalia, Dr. Theodore McCown and Professor Essor Henry Gleason discovered a highly-cemented gravel-bed with huge basaltic or dolerite flakes and pebbles on the Vel river at Shikarpur, 28 1/2 miles north-east of Poona.

Mrs. McCown found a fine chert point of Series II in the river-bed.

18. EARLY HISTORICAL SITE, DISTRICT THANA—Shri M. N. Deshpande discovered an ancient site at Kalyan, situated on the banks of the Ulhasyriver and referred to in the inscriptions of the western Indian caves and the *Periplus.* The collected finds included the patent Red Polished Ware and a few beads.

DELHI

19. SITE WITH THE PAINTED GREY WARE, DELHI—Shri Rameshwar Dayal reported the occurrence of sherds of the Painted Grey Ware at a small mound, 2 furlongs north of the medieval Badli-ki-sarai. On a further examination by Shri B. B. Lal and Dr. Y. D. Sharma, it was found that the strata yielding the Ware ranged from 3 to 5 ft. in thickness.

MADHYA PRADESH

20. SITE WITH THE NORTHERN BLACK POLISHED WARE, DISTRICT BHIND.—Shri J. P. Srivastava found the N. B. P. Ware at Lahar, 34 miles south of Bhind.

21. PROTOHISTORIC SITES, DISTRICT DHAR.—Shri R. B. Narain, found microliths, sherds of the black-and-red ware and black-and-grey ware, sometimes painted as at Prakash, at Kanwan and Kesur.

22. MICROLITHIC SITES, DISTRICT INDORE.—Shri R. B. Narain found microliths at Bichauli Tekri, Patalpani and Choral.

23. MICROLITHIC SITES, DISTRICT JABALPUR.—Shri C. B. Trivedi found microliths at Hantala, Dongaria Rajaram, Dabkia and Sahajpuri.

24. SITE WITH THE NORTHERN BLACK POLISHED WARE, DISTRICT JABALPUR.—Shri C B. Trivedi found sherds of the N. B. P. Ware at Tewar, 8 miles to the west of Jabalpur.

25. PROTOHISTORIC SITE, DISTRICT MANDASOR.—Shri B. K. Thapar found microliths, painted pottery of the chalcolithic assemblage, the Northern Black Polished Ware and a sherd of fine grey ware at Awara on the bank of the Chambal river.

26. MICROLITHIC SITE, DISTRICT NIMAR (KHANDWA).—Shri C. Krishna found microliths at Kodri and Ner.

27. PALAEOLITHIC SITE, DISTRICT NIMAR (KHARGAON).—Shri B. B. Lal and Shri B. K. Thapar found some palaeolithic tools and microliths along the Narbada at Raverkhedi.

28. STONE PILLAR, BHOPAL, DISTRICT SEHORE.—A stone pillar, roughly ascribable to the Gupta period, was recently spotted in Umrao Dullah's garden on the outskirts of Bhopal (pl. LXXXII A). It seems to have been brought from elsewhere and erected on the present site, with provisions for hanging lights, etc., below the finial. The polish and material of the pillar have a striking similarity with those of the Mauryan times, but the shaft, which bears an inscription in shell-characters (pl. LXXXII B), lacks the characteristic taper of the Mauryan pillars.

MYSORE

29. EARLY HISTORICAL SITE, DISTRICT BANGALORE.—Dr. M. Seshadri found the Russet-coated Painted Ware at Anekal. Besides, some monuments of the thirteenth-fourteenth century in the Dravidian style were also found here.

30. PALAEOLITHIC SITE, DISTRICT BUAPUR.—Shri M. N. Deshpande discovered palaeolithic tools, mostly rolled and lying loose in the bed of the Malaprabha river, near the famous temple-township of Pattadakal. The tools comprised cleavers, chopper-chopping tools and handaxes of the Abbevillean and Abbevilleo-Acheulian types. Similar tools had previously been picked up at Nandikeshwar in the bed of the same river (*1955-56,* p. 68).

31. EARLY MEDIEVAL SITE, DISTRICT CHITALDRUG.—Dr. M. Seshadri found inscribed *viragals* at Chikmadhure, a site of the early Ganga and Nolamba-Pallava periods.

PANJAB

32. EARLY MEDIEVAL SITE, DISTRICT KARNAL.—Dr. Y. D. Sharma further examined the already-explored mound at Thaneswar, locally known as Harsh-ka-Qila and traditionally believed to represent the capital of king Harshavardhana. Surface-finds of pottery confirmed its early medieval date, possibly going back to the Gupta period.

RAJASTHAN

33. SITES WITH THE PAINTED GREY WARE AND EARLY MEDIEVAL SCULPTURES DISTRICT BHARATPUR.-Shri D. P. Agarwala found the Painted Grey Ware at Kaman,

17 miles from Deeg. In the course of exposing the plinth of the so-called Chaurasi-khamba mosque at the same site, a few sculptures and ornate architectural fragments, including a stone inscription of *circa* ninth century A. D., were also discovered.

34. MICROLITHIC SITE, DISTRICT KOTAH.—Shri B. K. Thapar found microliths along the banks of the Parwani river at Kakoni.

UTTAR PRADESH

35. STONE BUDDHA-HEAD AND EARLY MEDIEVAL SCULPTURES, DISTRICT AGRA. —Shri S. C. Chandra found a stone Buddha-head of the typical mottled Mathura red sandstone (pl. LXXXI B) in an excavated trench near the Dak Bungalow at Fatehpur Sikri and early medieval sculptures at Tehu, a village in Tehsil Etmadpur. From a locality close to the latter site were also recovered a few Kushan coins.

36. SITES WITH THE PAINTED GREY AND NORTHERN BLACK POLISHED WARES, DISTRICT BIJNOR.—Shri S. C. Chandra found sherds of the Painted Grey Ware at Daulatabad or Husainabad, 11 miles from Najibabad, on the left bank of the Gangan river, and at Samipur, 4 miles from Najibabad, on the Najibabad-Kotdwara road. The former site also yielded the N. B. P. Ware, besides punch-marked and cast copper coins.

37. EARLY MEDIEVAL SCULPTURES, DISTRICT ETAH.—Shri S. C. Chandra found several sculptures of the early medieval period at the protected mounds of Nokhas and Nokhera, the former having previously yielded the famous Rukmini image.

38. SITES WITH THE NORTHERN BLACK POLISHED WARE, DISTRICT FATEHGARH.—Shri S. C. Chandra found the N. B. P. Ware at Bahua, 15 miles from Fatehpur on the Fatehpur-Banda road, at Baragaon, 6 miles west of Gha'zipur, and at Pama, about a mile to the north-east of Ghazipur.

39. SITES WITH THE NORTHERN BLACK POLISHED WARE, DISTRICT KANPUR.—Shri S. C. Chandra discovered the N. B. P. Ware at Ujhan and Umaragarh.

WEST BENGAL

40. MICROLITHIC AND NEOLITHIC SITE, DISTRICT BANKURA.—Shrimati D. Mitra found a large number of microliths, three neoliths and five Puri-Kushan coins at Chiadah.

41. MEDIEVAL SCULPTURES, DISTRICT BURDWAN.—Shri Gour Mohan Ganguly discovered a unique stone image of snake-hooded and twelve-handed Vishnu-Lokesvara of *circa* twelfth century A. D. at Sanchra. See also p. 72.

42. EARLY MEDIEVAL AND LATER SITES, DISTRICT MIDNAPUR.—Shri Gour Mohan Ganguly found an inscribed terracotta plaque of the early Gupta period showing a seated Buddha, at Panna (pl. LXXXVIIB), a sculpture of the eleventh century A. D., showing a bearded royal personage, apparently in the pose of a *bhakta* (pl. LXXXVIII B), at Contai, and a stone image of Siva-Isana of the twelfth century A. D., at Byabatterhat. See also p. 72.

43. EARLY HISTORICAL SITES, DISTRICT 24-PARGANAS.—The Asutosh Museum of Indian Art, Calcutta, collected more objects from the previously-explored sites of Atghara, Chandraketugarh and Harinarayanpur *(1956-57,* p. 8.1). From Atghara, Shri P. G. Das Gupta and Shri A. Chatterjee found an early terracotta depicting a male warrior (pl. LXXXIII, *3),* other figurines, both human and animal, and sherds of the Rouletted Wave (pl. LXXXIII, *4* and *5).* In addition, Shri S. Samanta collected an inscribed seal. From Chandraketugarh Shri P. Shome collected a terracotta seal, which, in its treatment of the figures, shows foreign affinities (pl. LXXXIII, */*). Other noteworthy antiquities from the same site included terracotta figurines showing a headless warrior assignable to the Kushan period (pl. LXXXIV, *6),* a royal couple on a caparisoned elephant led by a mahout, of the Sunga period (pl. LXXXIV, 5), and *yakskis* with elaborate head-dresses, of Mauryan period (pl. LXXXIV, *4),* and polished stone fragments inscribed in early Brahmi characters. Shri S. Roy discovered a red sandstone figure of Buddha, resembling the seated Buddha of the Mathura school, at Khana-Mihirer Dhipi in the environs of Chandraketugarh (pl. LXXXVII A). From Harinarayanpur Shri P. C. Das Gupta secured a terracotta seal showing two beak-headed abstract figures facing each other (pl. LXXXIII, 2), the treatment of the head roughly recalling some of the Harappan seal-types. Besides, several terracotta figurines, punch-marked and cast coins, beads and sherds of the black-and-red ware were also collected from the site. Of the terracotta figurines, special mention may be made of the plaques showing the lower part of a female figure with splayed-out hip's of the pre-Mauryan period (pl. LXXXIV, *3),* a *yakshi* with diaphanous drapery (pl. LXXXIV, *1)* and a rattle with a seated figure (pl. LXXXIV, 2). See also pp. 51 and 72. Sherds of the Rouletted Ware were found at Baral on the Adiganga, about 5 miles from South Calcutta.

VI. MUSEUMS

1. RAJPUTANA MUSEUM, AJMER.—The following were the important acquisitions : a miniature standing figure in stone, attributable to the eleventh century, from Arai, District Ajmer; a fine image of Vishnu accompanied by Brahma with his consort on his right side and Rudra with his consort on the left, of the same date, collected from the neighbourhood of Kishangarh, District Ajmer; and an image of Parsvanatha in marble, with a three-line inscription on the pedestal, bearing the date *samvat* 1150 (A. D. 1093). The additions to the coin-cabinet were two copper punch-marked coins and two gold coins, one of the standard-type of Samudragupta and the other of the archer-type of Chandragupta.

A long-felt inconvenience in the sculpture-gallery was removed by the installation of flood-light to give a clear view of the exhibits. Labels in English and Hindi are being provided for all the exhibits.

2. ALLAHABAD MUSEUM, ALLAHABAD.—The acquisitions included fortythree terracottas, variously from Jhusi, Kausambi, Ahichchhatra (pl. LXXXV), Bhita and Mathura, seventyseven beads, fiftyfour paintings, three sealings and one sculpture, besides a large number of coins. The important among the terracottas were a Mahishamardini figurine, from Ahichchhatra, and two heads, one female, painted red, of the Buxar type, and the other a male, resembling the Pataliputra type, and a *mithuna* figure from Kosam. Of the acquired coins mention may be made of four Gupta gold and five copper coins, five rare coins of the Kotas and a cast coin of Kausambi. In the paintings-section the more important additions were a dozen paintings from Mathura in pure and mixed Mughul and Rajput styles, some of them illustrating the story of Shirin and Farhad.

3. ARCHAEOLOGICAL MUSEUM, AMARAVATI.—Labels in English and Telugu were provided for the exhibits. All the exhibits were numbered.

4. MUSEUM AND PICTURE-GALLERY, BARODA..-The new additions were a headless image of Baladeva in reddish granite, of *circa* seventh century A. D., and a few medieval sculptures and a terracotta Ganesa, from Pavijetpur. A surface-collection of antiquities, comprising chert blades, beads, conch, terracotta bangle-pieces and figurines and pottery was also added.

A special dust-proof show-case was prepared for a suitable display of terracottas. Two show-cases in the historical archaeology section were also made dust-proof.

5. STATE MUSEUM, BHUBANESWAR.—The following objects were acquired for the Museum: three Buddhist images, including one of Buddha, from Mahanaga, District Cuttack; one image of Rishabhadeva, from Charampa, -District Balasore; two sets of copper-plate grants of Umavarman and Nandaprabhanjanavarman of the Mathara dynasty, discovered in Chikti Taluk, District Ganjam; and three hundred and eighteen Oriya palm-leaf manuscripts,' acquired from different parts of Puri and Ganjam Districts. Four stone sculptures and thirteen wood-carvings were received on an exchange-basis from the Superintendent, Government Museum, Madras.

6. ARCHAEOLOGICAL MUSEUM, BODH-GAYA.—Six stone sculptures, including four images of Buddha and two, one each of Tara and Vishnu, all of the Pala period, were acquired for the Museum.

7. MUSEUM OF THE DIRECTOR OF ARCHIVES AND HISTORICAL RECORDS, BOMBAY.—Two old guns, three wooden carriages and a few bronze and brass images were acquired through gift or purchase.

8. PRINCE OF WALES MUSEUM, BOMBAY.—The collection was enriched by the acquisition of five remarkable sculptures from north Gujarat, the finest of them, an image of.Kshetrapala (pl. LXXXVI A), with three others, viz. a bull, a colossal Ganapati and Surya (pl. LXXXVI B), belonging to the early Rashtrakuta period, and the fifth, also a Ganapati image, attributable to the late Rashtrakuta period. In both the Ganapati images the crown *(karanda-makuta* or *jata-makuta)* is absent and the elephant's temple is fashioned in a natural way, a characteristic feature of the Ganapati images of western India.

The following coins were added through gift or purchase: eight punch-marked silver coins; two silver Indo-Greek coins, three silver Western Kshatrapa coins; one copper Kalachuri coin; four silver Chahamana coins; three gold and fifteen silver coins of the Sultans of Delhi; one gold coin of the Sultans of Jaunpur; two gold, one silver and seven copper coins of the Mughuls; two gold Vijayanagara coins; and one silver East Indian Company coin.

9. ASUTOSH MUSEUM OF INDIAN ART, CALCUTTA.—The Museum was greatly enriched by the acquisition of about two thousand antiquities, including a red sandstone figure of Buddha, terracotta seals and plaques, coins, beads and pottery, derived from explorations at Chandraketugarh, Harinarayanpur and Atghara, all in the vicinity of Calcutta (above, pp. 51 and 70; pls. LXXXIII, LXXXIV and LXXXVII A). Further, Shri Gour Mohan Ganguly collected the following: a terracotta plaque showing Buddha in *bhumisparsa-mudra,* inscribed with the Buddhist creed in early Gupta characters, from Panna, District Midnapur (pl. LXXXVII B); an impressive statue in chlorite (pl. LXXXVIII B) of a bearded royal personage, shown apparently in the role of a devotee, accompanied by the members of his family and other attendants, of *circa* eleventh century, and a stone image of Siva-Isana, of *circa* twelfth century, respectively from Contai and Byabatterhat, District Midnapur; and a multi-armed Vishnu Lokesyara, of *circa* twelfth century, from Sanchra, District Burdwan (above, p. 69). Five stone images from West Dinajpur, including a Vishnu-Vamana of the eighth-ninth century (pl. LXXXVIII A), a seated Gaja-Lakshmi of *circa* tenth century and a seated Sadasiva of *circa* twelfth century, and a seated bronze Buddha of *circa* tenth century, from Mayhamati, District Tipperab, and several gold coins of Akbar and Shah 'Alam II were received as presents.

A number of paintings of the Mughul, Rajasthani and Pahari schools, painted banners, showing the Krishna legend and scenes from the epics, from Jodhpur, and textiles, including a fine old coloured muslin-piece of the *agni-phul* variety, from Dacca, were acquired by purchase.

10. INDIAN MUSEUM, CALCUTTA.—Substantial additions to the collection were made through gift or purchase. Notable among them were stone sculptures of Vajrasana Buddha of *circa* twelfth century, from Barrackpore near Calcutta (pl. XCI A), and Harihara-pitamaha of *circa* twelfth century (pl. LXXXIX B) and Vishnu of *circa* tenth century (pl. LXXXIX A), both from Navagram, District Murshidabad.

The collection of terracottas included some fine Sunga toys and animal and human figurines of the early centuries of the Christian era. Fortyone potsherds were acquired from Chandraketugarh and Harinarayanpur, both in District 24-Parganas. Further, pottery found in the excavations at Kausambi, Ahichchhatra and Hastinapura were received on loan from the Director General of Archaeology. Of the other acquired objects were a painted Nepalese wooden image of Manjusri seated with his *sakti,* of *circa* seventeenth century (pl. XCI B), a palm-leaf Nepalese manuscript of the *Ashtasahsrika-prajnaparamita* (pl. XC), an illuminated hand-made paper manuscript of the *Pancharaksha* of Newari-samvat 818 (A. D. 1698), written during the rule of Bhupatindramalla of the Bhatgaon branch of the Malla dynasty of Nepal, and a Nepalese *tanka* showing Avalokitesyara inside *mandala,* of *circa* seven-teenth century. A few Arabic-Persian stone inscriptions were acquired; they include a Persian epigraph dated A. H. 1136 (A. D. 1723-24) from Lalbagh, District Murshida-bad, a broken Arabic inscription (1489-90) of Sultan Nasiru'd-Din Muhammad Shah II of Bengal, from Kalna, District Burdwan, which supplies the missing portion of the Arabic inscription found at the same place long ago; and two inscriptions of Sultan Alau'd-Din Firuz Shah (pl. LXXXIX C) and Sultan Husain Shah of Bengal, respec-tively dated A. H. 939 (A. D. 1532-33) and A. H. 918 (A. D. 1512-13), both from Kalna. As many as one hundred and thirtysix coins were acquired. They included one copper coin of Azes I, one die-struck coin and seventytwo cast copper coins from Harinarayanpur, one copper cast and thirtythree silver punch-marked coins from Chandraketugarh, besides three silver coins of Akbar and one silver coin of Islam Shah, ' all acquired by purchase. The. Government of Uttar Pradesh presented one gold coin of Muhammad bin Tughluq struck in the name of Qalif al Haqim II, nine copper coins of Sher Shah and Islam Shah, one bullion coin of Muhammad Shah of Jaunpur and thirteen coins of Akbar.

11. CHANDRADHARI MUSEUM, DARBHANGA.—The present collection, originally belonging to Shri Chandradhari Singh and his sons of Darbhanga, was purchased by the Government of Bihar, which has converted it into a State Museum. The collection consists of more than ten thousand objects including paintings, textiles, coins and manuscripts, besides other objects.

The paintings, numbering about nine hundred, represent all the important schools, such as the Persian, Mughul, Rajasthan, Kangra, etc. Of special interest are the sets of paintings illustrating the *Ramayana, Gita, Gita-Govinda, Shah-nama,* etc. Of the manuscripts, about five hundred in number, those of the Virata-parvan of the *Mahabharata,* written in the Mithilakshara of the fourteenth century, deserve special mention. The collection of coins includes eleven Gupta gold coins, besides a large number of punch-marked, Indo-Greek and Western Kshatrapa ones. The exhibits are being properly displayed with labels in English, Hindi and Maithili.

The fresh acquisitions of the year comprised six sculptures, including those of Bodhisattva, Tara, Surya and Ganesa, seventysix paintings of different schools and a number of manuscripts, besides several other art-objects.

12. FORT MUSEUM, DELHI.—The Museum received from the National Museum two plaster-cast busts of Bahadur Shah II and Zinat-Mahal for display.

13. STATE MUSEUM, GAUHATL—The acquisition included a glazed earthen jar of China clay with two dragons in relief and clay models of temples, temple door-frames and royal palaces of Assam, besides seventeen coins of the Ahom period.

14. ARCHAEOLOGICAL MUSEUM, HAMPL—About one hundred sculptures were added to the collection, besides thirty copper coins, four brass figures of Dipa-Lakshmi, forty palm-leaf manuscripts, two pottery storage-jars and a fine shield of Bidri Ware.

15. MUSEUMS, JAMNAGAR AND JUNAGARH.—Some textile and handicraft decorative pieces were acquired for both the Museums.

16. ARCHAEOLOGICAL MUSEUM, KHAJURAHO.—About a dozen sculptures found within the area of western group of temples were transferred to the Museum. Labels were provided for all the important sculptures arranged in the central court of the Museum.

17. ARCHAEOLOGICAL MUSEUM, KOLHAPUR.—The following objects were added to the collection through gift, collection or exchange: three paintings and two embroidery-works; a copper coin of 1742 and three old copper coins; and four ancient sculptures from the premises of the Maha-Lakshmi temple.

18. ARCHAEOLOGICAL MUSEUM, KONDAPUR.—Microliths, about five hundred in number, were collected by the Curator of the Museum, on the banks of a small stream to the north of the Museum-building. The collection, consisting of blades, scrapers, cores, etc., was added to the Museum.

19. STATE MUSEUM, LUCKNOW.—Twentyfour objects were acquired for the Archaeological Section, of which a Gupta terracotta panel with a leafy border, showing a male figure standing with outstretched arms, and a Mathura-stone stele originally depicting the *nava-grahas,* now Sukra and Sani only extant, deserve special mention.

Attention was paid to the display of the exhibits. Copper-plate inscriptions, hitherto in the reserve-collection, were displayed chronologically in a large show-case. A new case was also prepared for displaying the Mohenjo-daro antiquities.

20. FORT ST. GEORGE MUSEUM, MADRAS.—The collection was enriched by the acquisition of ten colour-prints showing the places of historical importance in south India, seven rare models purchased from Colonel Phythian Adams of Ootacamund and two gold *mohars* and twelve gold coins, acquired as treasure-trove finds.

21. GOVERNMENT MUSEUM, MADRAS.—Thirteen metal images, including a group of bronzes in the later Chola style and another in the later Pandya style, and a set of fifteen copper-plate inscriptions were added to the collection. The following coins were acquired: eightythree silver punch-marked coins, from Periamambatta, District South Arcot; two gold and one silver coins of Muhammad bin Tughluq, presented by the Uttar Pradesh Coin Committee; a copper coin of the Vijayanagara ruler Devaraya II; coins of the East India Company; Gajapati pagodas; and coins of Haider Ali and Tipu Sultan of Mysore.

22. MUSEUM, DIRECTOR OF ARCHAEOLOGY, MYSORE.—Such pieces as could be recovered of a beautiful bronze Nataraja image of the eleventh century in the Somesvara temple at Mulbagal, stolen and sawn two years' ago, were displayed.

23. CENTRAL MUSEUM, NAGPUR.—The coin-cabinet of the Museum is being reorganized and was enriched by the acquisition of one gold, nine silver and twelve copper coins.

24. ARCHAEOLOGICAL MUSEUM, NALANDA.—The acquisitions included a stone image of a female deity and a slab showing a Jina in standing posture.

Extensive additions and alterations to the building are in progress to make it more suitable for museum-purposes.

25. CENTRAL ASIAN ANTIQUITIES MUSEUM, NEW DELHI.—Several stucco figures and paper paintings with Chinese inscriptions were taken out of the reserve-collection and exhibited after chemical treatment. In order to improve the standard of display, minor objects in the galleries were arranged typologically.

26. NATIONAL MUSEUM, NEW DELHI.—The Museum witnessed considerable progress in all directions. The objects in the collection were classified and accessioned in respective registers. An elaborate programme was drawn up for publications, the material for a number of which is now press-ready. The nucleus of a full-fledged chemical laboratory was set up and the work of the treatment and preservation of art-objects is progressing satisfactorily.

The collection was enriched by the acquisition of a large number of paintings, textiles, jades, jewellery, etc., noteworthy of which were a set of Bhagavata paintings of the Kangra school (pl. XCII B) and a rare manuscript of the *Shah-nama,* illustrated with the paintings of the Shiraz school and attributable to the fourteenth century (pl. XCII A). Among other additions mention may be made of an inscribed Buddha image of the early Gupta period (pl. XCI C) and about five thousand antique arms, including one dated dagger of Aurangzeb (pl. LXXXVI C), collected at Hyderabad during the Razakar movement, which was among the objects presented to the Museum by the Andhra Pradesh Government.

The Museum organized an exhibition on the occasion of the centenary celebrations of the 1857-Movement in the Rashtrapati Bhavan during August and September 1957. The exhibits included life-size models of Bahadur Shah II and his empress Begam Zinat-Mahal and of Tipu Sultan. The actual dress, jewellery and other articles of personal use of emperor Bahadur Shah were displayed along with other relics of importance. The original records and objects came from the National Archives and Fort Museum, Delhi.

The annual exhibition of archaeological discoveries in the country, organized by the Department of Archaeology, was held in the Museum in September 1957.

27. MUSEUM OF ANTIQUITIES, PADMANABHAPURAM.—The exhibits were re-arranged and a complete photographic inventory of the whole collection in the Palace Museum was made.

28. PATNA MUSEUM, PATNA. -The most important acquisition was a sandstone bull-capital bearing traces of the Mauryan polish (pl. XCIII), found at Lohanipur near Patna, which had yielded, in 1937, the well-known torso of a Jaina *tirthankara* of the Mauryan period, now housed in the Museum. Other acquisitions, through gift or purchase, included a bronze image of Siva (pl. LXXXVII C), four stone sculptures and two inscribed stone tablets of the Muslim period.

29. WATSON MUSEUM, RAJKOT.—Over thirty portraits of historical personages, such as the Rani of Jhansi, Tantya Tope, etc., were received as gift. A few textiles and handicraft decorative pieces were also acquired.

30. ARCHAEOLOGICAL MUSEUM, SARNATH.—Fourteen sculptures and architectural pieces were transferred to the collection from the archaeological site of Sarnath.

Among the other acquisitions were specimens of the Northern Black Polished Ware from Rajghat and Palang-Shahid and knobbed ware from the Aktha brickyard, all in the neighbourhood of Varanasi.

31. TRICHUR STATE MUSEUM, TRICHUR.—Plans for the development of the Museum were implemented. An additional ground with a suitable building thereon adjoining the existing Museum was acquired and the art and archaeological objects were transferred to this new building.

32. BHARAT KALA BHAVAN, VARANASI.—The collection of the Museum was enriched by the acquisition of many important objects. With a grant from the All-India Handicraft Board could be purchased several rare and representative specimens of Mughul *shawls,* brocades and prints, which supplied new designs and inspirations to the local artists and weavers of Banarasi *saris.* A large Nepalese banner depicting the Dhyani-Buddha Amitabha (54 in. x 31 in.), perhaps one of the best examples of its kind, dated colophons, leaves of some Jaina manuscripts, Rajasthani and other paintings and an almanac of *samvat* 1620 formed valuable additions to the paintings-section. Among other art-objects, mention may be made of some dagger-hilts of jade and quartz, a large shield of rhinoceros-hide of the Mughul period and three large pieces of *ladli,* inscribed respectively with the'names of (1) Islam Shah, A. H. 951, (2) Sahib Kiran Sani Akbar, A. H. 1016, Jahangir, A. H. 1016, and Shah Jahan, A. H. 1043, and (3) 'Ahmad Shah Durrani, A. H. 1174.

The additions to the archaeological section included terracottas from Rajghat, Ahichchhatra and several other sites from private collections, a Buddha head of the Gupta period, two copper-plate grants of Raja Udyot Chandra Deo, dated Magha *sudi* 15, Guru-vara, 1604 Saka, and a brass model of a medieval fortress of the eighteenth century.

Three hundred and fortyone coins, including silver punch-marked ones, Kushan and Gupta gold ones and silver and gold Mughul ones, were acquired.

VII. ARCHITECTURAL SURVEY OF TEMPLES

The SUPERINTENDENT, TEMPLE-SURVEY PROJECT, NORTHERN REGION, completed his survey of the Gupta and late Gupta temples of central India *(1956-57,* p. 69) and took up the other early temples of north India, dating from *circa A.* D. 400 to 800.

A survey was also made of the Pratihara and Kachchhapaghata temples of central India, and work on the Paramara and Kalachuri temples in the same region is in progress. The Kalachuri temples covered during the year included the group of temples at Bheraghat, Amarkantak, Gurgi, Chandrehe and Masaun, the temple of Vaidyanatha at Baijnath, Mahadeva temple at Nohta, Siva temple at Marhibagh and Viratesvara temple at Sohagpur, all in Madhya Pradesh.

Outside central India a study was undertaken of the groups of temples at Chitorgarh, Jhalrapatan, Ekalinga, Kumbharia, Delwara on Mount Abu and Wadhwan (pl. XCIV) in Rajasthan, of the early and the Chaulukya temples of Gujarat (pl. XCV) and Saurashtra, of the cave-temples at Ajanta and Ellora and the excavated as well as structural temples at Badami, Aihole, Pattadakal and Mahakutesyara in Bijapur District. The study of the last-named group of monuments, undertaken jointly with the Superintendent, Temple-survey Project, Southern Region, has provided evidence for the derivation of the southern and northern styles from common sources and the gradual crystallization of the peculiarities of the respective styles in course of their diffusion through time and space.

The monograph on the Khajuraho temples has been completed but for finishing touches, and work on a second monograph on the early temples of north India *(circa* A. D. 400-800) is in hand.

The SUPERINTENDENT, TEMPLE-SURVEY PROJECT, SOUTHERN REGION, prepared, as a result of the survey of the temples of the Pallavas *(1956-57,* p. 69), a monograph on the Pallava cave-temples, completed with glossary and illustrations. The final draft of the second monograph, on the monolithic temples of the Pallavas, is also being made ready for the press, while the results of the survey of the structural temples, which form the material for the third monograph, are under compilation. The study, particularly of the structural temples, in comparison with those of the Chalukyan area, brings to prominence the attempts of the Pallava builders to utilize in their structural experiments hard stones like granite and gneiss, the rocks of which material they had successfully excavated into or carved out as cave-temples or monolithic shrines. This is noticeable in their attempts to use granite slabs, in the stripping of which from the rocks there had been a long tradition dating from the megalithic times, in the construction of the structural temples. These attempts were either in the dolmenoid fashion, with the use of large orthostatic slabs and roof-slabs, the former sculptured, or in the composition of the various mouldings with tiers of thin slabs, laid flat or arranged to stand on edge, recessed or projected as the case might be, while the walls were of large vertical slabs or an alternating series of vertical and horizontal slabs, the box-like cavities inside being filled up with masonry. However, the attempts, which did not conduce much to stability or help in the erection of very large structures, were abandoned, and a deliberate

search for suitable soft stones like sandstone was made, so that their builders could compete with the contemporary early Chalukyan builders in similar soft stones. It was this stone from the local formations, a rather coarse greyish variety of sandstone, that was quarried in blocks and transported over distances to the site of work, cut, carved or moulded according to requirements, for the construction of the many fine temples dating from the time of Rajasimha (pls. XCVI and XCVII). But towards the close of the Pallava period sufficient skill appears to have been acquired in the quarrying and working of hard granites or gneisses and in the construction of temples with that material, very good examples of which are found built from the times of Dantivarman and his successors. That attempts were made to use hard stones like granite or gneiss as some constituents even in the constructions of the earlier Pallava period, at least as pillars of *mandapas* of the type reproduced by the rock-cut cave-temples if not in whole structures like the *vimanas,* is revealed by a few extant granite or gneiss pillars with the inscriptions of Mahendravarman I or Narasimhavarman I Mamalla.

Simultaneously, the survey of the cave-temples of the Muttaraiyars and the Pandyas in the Chola and Pandya countries have brought out many features which distinguish them not only from those of the Pallavas but also from each other. Such cave-temples in Madurai and Tiruchirapalli Districts and parts of the Pudukkottai region have been surveyed. After the completion of the survey of a few remaining cave-temples of this area in Ramanathapuram, Tirunelveli and Kanyakumari Districts, the material is to be compiled as a separate monograph.

Since the Deccan area, particularly Bijapur District, contains a large number of early temples relating to the northern and southern styles occurring side by side, a joint preliminary survey of these temples in the Chalukyan and Rashtrakuta area was made with the Superintendent, Temple-survey Project, Northern Region. In addition to facilitating the separation of the types as northern and southern, the survey has afforded material for a comparative study useful in the finalization of the monograph on the structural temples of the Pallavas.

VIII. PRESERVATION OF MONUMENTS

MONUMENTS OF NATIONAL IMPORTANCE

NORTH-WESTERN CIRCLE

Delhi

1. ADHAM KHAN'S TOMB, DELHI.—The floor in the interior of the main tomb and its adjoining verandahs, which had considerably decayed, was re-laid with lime-cement concrete.

2. BAHLOL LODI'S TOMB, DELHI.—The northern walls of the tomb were raised to a further height by new masonry over the existing wall. The fallen and damaged patches on the southern and western fencing-walls were repaired and open joints and cracks pointed.

3. CITY-WALL, DELHI.—A long stretch of the wall was reconstructed and other portions re-pointed.

4. HAUZ-KHAS, DELHI.—The broken eastern compound-wall was rebuilt after a careful dismantlement. An interesting discovery was that of a flight of steps from the north-eastern corner of the Hauz-khas complex to the reservoir below, which had been lying buried under thick debris (pl. XCVIII).

5. JAHAZ-MAHAL, DELHI.—The decayed floor on the western, northern and eastern sides of the monument was removed and replaced by new lime-cement concrete.

6. JAMI'-MASJID, DELHI—Work continued *(1956-57,* p. 44) steadily. A number of weather-worn red sandstone slabs of the basement were replaced by new ones on the south, west and north. Some ornamental stones of the eastern gateway were fixed in lime-cement mortar with copper and stone dowels after a careful dismantlement of the decayed stones. The joints and cracks all over the mosque were filled with liquid cement-mortar and made watertight.

7. KALI-MASJID, DELHI.—The northern and western walls of the imposing Tughluq mosque, which had long been in disrepair, were rebuilt, while the open joints of the masonry in other parts were repaired.

8. MANDHI-MASJID, DELHI.—The worn-out floors of the main entrance and the western verandah were removed and replaced by fresh material. Around the open courtyard inside the mosque approach-paths were provided.

9. QADAM-SHARIF, DELHI.—A portion of the dome on the south-west bastion had collapsed and part of the plinth damaged. They were reconstructed to match with the original appearance (pl. XCIX).

10. QILA RAI PITHORA, DELHI.—The fortification-wall on the east of the Delhi-Qutb road was rebuilt with old material over a long length and was made watertight.

11. QUTB-MINAR, DELHI.—Certain portions of Alau'd-Din-Khalji's mosque and Madrasa, which had developed wide open joints and cracks, were repaired. The western and eastern compound-wall was also repaired in parts.

12. RED FORT, DELHI.—The broken red sandstone pieces of the balcony of the Rang-Mahal were replaced and its asbestos ceiling renewed. The ornamental marble fountain in the centre of the hall was enclosed with a movable railing to protect it from being gradually worn out under the shoes of the visitors. At the Moti-Masjid, the fallen and damaged portions of the plastered exterior were repaired and colourwashed.

13. SULTAN GHARI'S TOMB, DELHI.—A culvert was constructed over the approach-path laid last year *(1956-57,* p. 44). The path itself, damaged by the rains, was also repaired.

14. TUGHLAKABAD FORT, DELHI.—In order to arrest further decay, the facing of the eastern bastion of the main entrance opposite Ghiyathu'd-Din's tomb was rebuilt in parts.

15. 'ABDUR RAHIM KHAN-I-KHANAN'S TOMB, NEW DELHI.—The decayed concrete on the roof around the main dome was removed and new lime-concrete laid. A few worn-out red sandstones fixed in the plinth of the north-west *chhatri* were replaced with new ones. With the work executed so far *(1955-56,* p. 34; *1956-57,* p. 44), the monument has considerably improved (pl. C).

16. ARAB-SARAI, NEW DELHI.—The masonry of the eastern and southern walls had fallen and bulged out in parts. It was reconstructed and the open joints pointed to arrest the growth of vegetation.

17. HUMAYUN'S TOMB, NEW DELHI.—The roof and broken floors of the passages in this tomb were re-laid with new lime-concrete. The openings in the staircase were provided with shutters. Large broken patches on the eastern and northern compound-walls were repaired.

18. KOTLA FIRUZ SHAH, NEW DELHI.—A part of the northern rampart-wall of the monument had been lying covered with debris and later accretions; they were carefully cleared and the plan of the original gateway on the north exposed. Similarly, to the north of the mosque between the Asokan pillar and the eastern rampart-wall, the remains of a quadrangular structure were uncovered. The eastern ram part-wall was also repaired over long stretches, some of the openings in it being provided with door-shutters. The rubble-stone walls of the basement of the pyramidal edifice bearing the Asokan pillar were extensively repaired. The incongruous turnstile at the main entrance was replaced by iron gates.

19. NAJAF KHAN'S TOMB, NEW DELHI,—The dead roof-concrete of the monument was removed and replaced with fresh material.

20. SAFDARJANG'S TOMB, NEW DELHI.—The damaged floors of the *dalans* attached to the gate-house and cells below the mosque were re-laid with new lime-cement concrete. The brickwork in the compound wall to the south of the entrance-gate was partly reconstructed and the joint-cracks filled.

Himachal Pradesh

21. TEMPLES, CHAMBA.—The salt and lichen-accretions were eradicated from the *sikharas* of Hari-rai, Bansi-Gopal and Vajresvari-devi temples and the open joints and cracks were grouted with coloured cement-mortar to match with the original appearance. The damaged wooden railing of the Hari-rai temple, a later addition, was replaced by a masonry parapet. At the Barisi-Gopal temple a new drain was provided for the proper drainage of water. The weather-worn slate roof of the Chamunda-devi temple was carefully dismantled and re-laid, the missing and decayed slatestones and wooden beams being replaced. The wide and deep openings, on the top of the small Siva temple were raked of thick vegetation and then grouted.

Panjab

22. FORT, BHATINDA.—Both on the exterior and interior of the fortification-wall, large patches of decayed brickwork were renewed with lime-cement mortar. The foundations of some bastions were exposed in order to ascertain whether the repairs in the superstructure would be able to bear the resultant load. Vegetation was also removed from the high walls of the. fort. The work is in progress.

23. SURAJ-KUND, DISTRICT GURGAON.—The fallen and bulged walls of the *garhi*-area on the west of this impressive reservoir were rebuilt with old material. An entrance to this area, which had become blocked owing to long neglect, was brought to light after a large-scale clearance of fallen stones.

24. FORT, KANGRA.—The removal of the later accretions brought to view two massive pillars, the lower portion of one of them being inscribed. The clearance also exposed an oval-shaped structure, about 20 ft. deep and 8 ft. in diameter.

Rqjasthan

25. TARAGARH GATEWAYS, AJMER.—The huge dilapidated wall adjoining the gateway was thoroughly repaired and strengthened.

26. BHATNER FORT, HANUMANGARH, DISTRICT GANGANAGAR.—The brick-work on the exterior of the southern fortification-wall was renewed in patches. A drain was constructed from the Hanuman temple to the entrance-gateway. The pathways were levelled and dressed and vegetation removed from the high walls.

27. HASRAT-MATA TEMPLE, ABANERI, DISTRICT JAIPUR.—The fallen sculptured stones of the temple, lying scattered in heaps all over the area, were arranged properly, and the place was cleared of vegetation and debris.

NORTHERN CIRCLE

Madhya Pradesh

28. GROUP OF TEMPLES, KHAJURAHO, DISTRICT CHHATARPUR.—The work consisted mainly of the general tidying up of the compounds of all the temples in the

different groups, making proper slopes for the easy draining of rain-water, further improvements to the approach-roads and spreading of *morum* over them. Expanded-metal frames were repaired and wire-net fixed where necessary to prevent bat-nuisance. Suitably-toned recessed pointing was done to the interior of the Matangesvara temple and the plinths of the other temples in the western group. The work of pointing on the Kandariya temple is in progress. It is proposed to improve the setting of the site by laying out lawns and plantations.

29. BIR SINGH'S PALACE, DATIA.—This palace, of considerable architectural importance, was till recently occupied by refugees, who had effected several additions and alterations thereto. These accretions were dismantled and the precincts cleared of the accumulation of rubbish and debris. The leaky portion of the terrace on the second floor was made watertight, patch-plastering attended to and rank vegetation eradicated. Pointing to the group of domes is in progress.

30. ASOKAN ROCK-EDICT, GUJARRA, DISTRICT DATIA.—A shed over this important inscription to protect it against weather-effects is under construction.

Rajasthan

31. MONUMENTS, B AY ANA, DISTRICT BHARATPUR.—The fallen parapet-battlements on the southern and eastern walls of the Usha-mandir were re-set and the leaky roofs made watertight. The bulged parts of the enclosure-wall of the Brahmabad 'Idgah were rebuilt and the cracks in the floor of the courtyard filled in after the removal of the vegetation-growth.

32. PALACES, DEEG, DISTRICT BHARATPUR.—The open joints in the floor of the overhead tank, which furnishes water to the fountains, for which the palaces are renowned, were pointed, to make it watertight. The sunken stone pavements of the causeways were re-set and the broken wire-gauge of shutters replaced.

33. CHAURASI KHAMBA, KAMAN, DISTRICT BHARATPUR.—The accumulated debris along the plinth of the temple was removed and the modern partition-walls between the highly ornamental pillars were dismantled. During clearance a stone inscription of the early Pratihara period and a few medieval sculptures and architectural fragments were brought to light. The bulged and overhanging portion of the wall on the south-western side was rebuilt and the facing stones re-set in position. The work is in progress.

Uttar Pradesh

34. FORT, AGRA.—Certain dilapidated floors of the more important buildings were renewed with stone flags. One of the blocked passages to the royal lavatories, situated to the south of the Jahangiri-Mahal, was opened up and its brickwork thoroughly repaired by way of underpinning and pointing. Further work is in progress.

35. IDGAH, AGRA.—The work, which had been in progress during the previous years *(1955-56,* p. 36; *1956-57,* p. 46), was successfully completed. The rebuilding of the roof of the southern compartment involved the replacement of all the twentyfour decayed brackets and as many as twenty *gardana*-stones.

36. 'ITIMADU'D-DAULA'S TOMB, AGRA.—The work of re-setting the loose inlay-pieces in the corner-towers and the plinth of the marble pavilion on the terrace was continued *(1956-57,* p. 46). The enclosure-wall was underpinned and the open joints filled.

37. RAM-BAGH, AGRA.—The originally-painted wall-surfaces of the *baradaris* in the Ram-bagh or Aram-bash, traditionally ascribed to Babur and later associated also with Jahangir and Nurjahan, had previously been extensively plastered over. The flaking of the plaster revealed at a few places the underlying paintings, a part of which was carefully exposed. In the lintel on the *baradari* to the north a series of spirited and life-like animal-figures were noticed. In one of the niches a fine painting of a lady, similar to the so-called Madonna at Fatehpur Sikri, also came to light. The decayed patches of lime-concrete and plaster in the pavilions were attend to and the portion of the fallen compound-wall on the north rebuilt.

38. TAJ MAHAL, AGRA.—The work on the dislodged pilaster, taken up last year *(1956-57,* p. 45), was successfully completed. The iron cramps, originally used for holding the stones and anchored into stone, blocks specially embedded in the brick-work behind the veneering, had got rusted, causing the fracture of the bond-stones; eventually the pilaster stones had been pushed forward creating a gap of 3 to 6 in. between the veneer and the brick core. The middle portion of the pilaster was the most-affected, the dislodgement having taken the shape of a bow. At the same time, it was gratifying to note that not a single crack had developed in the brickwork behind the pilaster.

The stones of the pilaster, together with the side-panels, were dismantled from top to bottom, a height of 90 ft. The dislodged stones were re-set in position by copper cramps, instead of iron ones, and the voids behind the veneer were thoroughly grouted. During the course of the repairs a broken marble inlaid stone, used as a bond-stone, had to be replaced by a new stone, similarly inlaid. A few other fractured or broken stones were also replaced and the missing inlay-pieces and bars restored. The work involved the bringing down from and lifting to a considerable height of very heavy stones, some weighing about 3 tons, on a high scaffolding (pl. CI).

The drain running along the foot of the wall on the riverside was opened to ascertain the cause of the cracks and the percolation of water in the underground vaults on the river-front. No cracks were noticed in the stone bed of the drain, but the chequered stone pavement alongside had longitudinal cracks, through which water apparently percolated. The cracks, one of them running to a length of 207 ft., were thoroughly grouted with cement and hydraulic lime. Trial-pits dug along the outer vail on the riverside to find out the foundation-strata exposed a series of wells used as foundation (pl. CII). A large number of loose inlay-pieces on the mausoleum were re-set and the missing ones restored to a great extent.

Similar work on the subsidiary buildings and the Mehman-Khana is in progress. The open joints in the facade of the monument were grouted.

The levels of the ' Taj Mahal and the verticality of the *minars* were again checked by the Survey of India. To minimize errors, a permanent bench-mark was constructed in the gardens.

39. GROUP OF MONUMENTS,FATEHPUR SIKRI, DISTRICT AGRA.—The inner face-of the city-wall, to the south of the Agra gate, which had fallen a year back, was rebuilt to a length of 16 ft. On the same wall, to the north of the gate, the outer facing of

the first bastion had collapsed during the rainy season. It was repaired together with the embattled parapets to maintain the imposing view of the undulating wall-top. In the Dargah of Sheikh Salim Chishti, the loose inlay-pieces of the great mosque were re-set, while the replacement of the missing stones in the plinth of the tomb was continued. In the Treasury, the rubble in-filling in the front wall was removed and the facing.stones restored. In the Turkish Sultana's Hammam, the bulged wall of rubble masonry was reconstructed and the adjacent fallen wall of the compound rebuilt. The dilapidated concrete floors of the *dalans* in the Pachchisi court were re-laid with stone flags, The spoil-earth deposited at the southern end of the Diwan-i-'Am was removed. The clearance of this heap has greatly enhanced the general appearance of the adjacent buildings.

40. FORT, JAGNER, DISTRICT AGRA.—The dislodged stones of the second *dalan* over the flight of steps leading to the Gwal-baba temple together with the uneven steps between the first and the second *dalans,* were re-set.

41. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.—The longitudinal cracks in the centre of the five arches in the north-east corner of the *dalans* running all round the main chamber of the mausoleum were attended to. The arches were opened out from below and rebuilt in ashlar-masonry in lime. To strengthen these arches further, reinforcement-bars were inserted at suitable intervals. The work is in progress. Some of the dislodged marble *golas,* inlaid bars and moulded stones of the panellings of the central arch of the mausoleum towards the north were re-set to a height of 40 ft. after the grouting of the cavities at the back and changing of the broken members thereof. The loose painted plaster inside the golden chamber was strengthened by the injection of plaster of Paris through small holes drilled in the plaster and the broken portions were neatly filleted. Decayed patches of concrete on the roof were treated afresh, dislodged stones of the pavement were re-set and the decayed ones renewed.

42. MARIAM'S TOMB, SIKANDARA, DISTRICT AGRA.—The open joints of the *chhajja-stoms* and the fractured portions of the intrados of the domes and pavilions were filled with lime-mortar and the cavities at the back thoroughly grouted.

43. FORT, GARHWA, DISTRICT ALLAHABAD.—The dislodged roof-slabs of the *mandapa* of the Vishnu temple, together with the bulged stones of the shrine *(1956-57,* p. 46) were dismantled and some of them re-set. The voids behind the facing stones were thoroughly grouted. The two dilapidated tanks *(baolis)* in front of the temple were repaired by the re-setting of the dislodged stones and recessed pointing of the masonry. The work is in progress.

44. EXCAVATED REMAINS, KAUSAMBI, DISTRICT ALLAHABAD.—The remains of the Ghoshitarama continued to receive attention. The topmost courses of the walls were dismantled and re-set in well-recessed cement-mortar and the tops of the walls covered with sifted earth.

45. GROUP OF MONUMENTS, KHUSRO-BAGH, ALLAHABAD.—The floor of the galleries around the tomb of Khusro's mother was re-concreted, some of the dislodged *dasa*-stones of the platform re-set and the wire-gauze of the ventilators repaired.

46. EXCAVATED REMAINS, AHIGHCHHATRA, DISTRICT BAREILLY.—Portions of brick-work in Sites I, II and HI were repaired, and the top two courses were re-set in invisible cement-mortar to make the walls watertight.

47. JAMI'-MASJID, DISTRICT ETAWAH.—The compound-wall was underpinned, cracks over the roof filled and patch-repair to the plaster carried out.

48. TOMB OF BALAPIR, KANAUJ, DISTRICT FARRUKHABAD.—The dislodged and loose facing stones were re-set after the eradication of rank vegetation and grouting of the cavities at the back. The roof was rendered watertight by fresh concrete.

49. GULAB-BARI, FA1ZABAD.—The repairs consisted of the re-setting of the dislodged coping stones of the first storey, pointing of open joints, filling of cracks, patch-plastering, re-laying of water-absorbent patches with new concrete and removal of rank vegetation.

50. BRICK TEMPLE, BHITARGAON, DISTRICT KANPUR.—The well-known Gupta brick temple, one of the earliest specimens of the *sikhara* type, received special attention. The whole of the upper portion of the *sikhara* down to' the ornamental cornice was thoroughly grouted and made watertight with stained mortar so as not to provide a contrast with the subdued antiquity of the decayed brickwork. The self-closing door of the cella was made to function and the compound-wall repaired.

51. IMAMBARA OF ASAFU'D-DAULA, LUCKNOW.—The fallen cupolas over the central entrance of the second gateway to the Imambara were restored and the decayed moulded plastering in the Rumi-Darwaza replaced.

52. NADAN MAHAL, LUCKNOW.—The broken *chhajj*a-stones were replaced, the wire-fencing strengthened and the compound tidied up.

53. RESIDENCY BUILDINGS, LUCKNOW.—Further improvements were carried out to the Residency buildings, transferred to the Union Department of Archaeology in 1956 *(1956-57,* p. 46). The compound-wall, broken at several places, was thoroughly repaired, thus preventing all unauthorized entry into the grounds. The other repairs consisted of extensive underpinning, pointing, edging, filling cracks, etc., in the different buildings and the replacement of six wooden steps in the mosque. The work of stone flooring to the verandahs in the Model Room, which houses a number of important historical paintings and other relics of the incidents of 1857, is in progress.

54. GOVIND-DEO TEMPLE, BRINDABAN, DISTRICT MATHURA.—The dark stains on the temple-facade, the result of rain-water, were cleaned and water-spouts provided to prevent the 'dripping of water over the entire surface. Decayed patches of roof-concrete were re-laid.

MID-EASTERN CIRCLE

Bihar

55. EXCAVATED STUPA, NANDANGARH, DISTRICT CHAMPARAN—The walls of the *stupa,* badly affected by saltpetre, were treated with mustard-cakes dissolved in water on an experimental basis to counteract salt-action. The result is being watched.

56. EXCAVATED REMAINS, NALANDA, DISTRICT PATNA.—The turfed areas both inside and outside the excavations were maintained in a satisfactory condition. The

kuchcha drain to the south of Site 12 was made *pucca* for the proper drainage of rain-water. The tops of the walls of votive *stupas* around the same site and the *chaitya* itself were made watertight. The undermined walls of shrines and Sites 8 and 13 were underpinned with chiselled and moulded bricks.

57. NEW FORT, RAJGIR, DISTRICT PATNA.—The open joints in a part of the stone fortification were treated with recessed pointing.

58. FORT AND GATEWAYS, ROHTAS, DISTRICT SHAHABAD.—The decayed floor of the open platform in front of the *baradari* was made good. The open joints of the ceiling of the Nach-ghar, Khoja-ghar and buildings near the Phul-Mahal were suitably repaired. The decayed pathways in the courtyard of the Shish-Mahal were renovated with lime-concrete, and the edges of the pathways were demarcated with rubble-stone masonry.

59. SHER SHAH'S TOMB, SASSARAM, DISTRICT SHAHABAD.—The lime-concrete floor and *ghundis,* which had given way at places, were repaired and the holes and crevices in the walls filled. The open joints of the veneer-stones in the verandah were also suitably filled.

Uttar Pradesh

60. AKBAR'S BRIDGE, JAUNPUR.—The missing stones of the parapet of the bridge, which had been washed away by a recent flood, were replaced.

61. IFTIKHAR KHAN'S TOMB, CHUNAR, DISTRICT MIRZAPUR—The breaches in the compound-wall of the tomb were repaired.

62. EXCAVATED REMAINS, SARNATH, DISTRICT VARANASI.—The turfed area inside the enclosure was maintained in a presentable condition and a further area of about 3000 sq. ft. on the north-east corner brought under turfing. The pathways were improved and extended. A part of decayed floor around the Dhamekh Stupa was replaced.

EASTERN CIRCLE

Assam

63. CACHARI RUINS, KHASPUR, DISTRICT CACHAR.—The open joints in the brickwork were filled in and worn-out bricks replaced. The compound was raised by earth-filling, levelled and dressed up.

64. AHOM RAJA'S PALACE, GARHGAON, DISTRICT SIBSAGAR.—Large-scale underpinning was done to support the load of the superstructure by the rebuilding of missing brickwork at the cornice-level. The leakage of rain-water was stopped by the replacement of the old terracing. Wall-tops were made watertight and the open joints filled in.

65. SIBDOL TEMPLE, GAURISAGAR, DISTRICT SIBSAGAR.—The spongy plaster was replaced, in addtion to the uprooting of trees and repairs to consequent damages.

66. GHANASYAM'S HOUSE, JOYSAGAR, DISTRICT SIBSAGAR.—The condition of the structure, remarkable for its terracotta plaques, was deplorable, with big trees having taken deep roots into the fabric of the structure and with wide cracks due partly to the trees and partly to earthquakes. The structure was thoroughly conserved this year with the eradication of the roots of the trees, grouting of cavities and voids and filling of cracks with a finish to match the original (pl. CIII). The eaves-edge and teeth-bricks were reproduced by cut tiles. The terracing was renewed after the re-setting of the loose bricks in their proper position.

67. KARENGHAR PALACE, JOYSAGAR, DISTRICT SIBSAGAR.—The exposed wall-tops were made watertight and cracks filled in. Debris was cleared from the structure.

68. SIBDOL TEMPLE, JOYSAGAR, DISTRICT SIBSAGAR—Minor repairs by way of uprooting trees, including repairs to damages, clearing weeds, filling in cracks and renewing fallen plaster in patches were carried out.

69. VISHNUDOL TEMPLE, JOYSAGAR, DISTRICT SIBSAGAR.—The decayed plaster of the spire was renewed after the filling in of the open joints and cracks. The missing and damaged brickwork on the spire, including the floral motifs, was replaced and the loose ornamental stones re-set in their original position. Trees were uprooted after the necessary dismantlement of brickwork and the consequent damages were made good. Arrangements were made for proper drainage.

70. SIBDOL TEMPLE, NIGRITING, DISTRICT SIBSAGAR.—Plants were uprooted and the damages mended. The cracks in the ceiling-wall and roof were filled in.

71. DEBIDOL TEMPLE, SIBSAGAR.—The levelling and dressing of the compound, uprooting of trees, making good of the damages caused by them and filling in of cracks in the ceiling and walls constituted the items of repairs.

Orissa

72. BUDDHIST REMAINS, LALITAGIRI HILL, DISTRICT CUTTACK.—To house the numerous sculptures lying scattered on the hill and in the village, the construction of a building was taken up and is now in progress.

73. GROUP OF TEMPLES, BHUBANESWAR, DISTRICT PURL—In the Vaital Deul the leakage from the roof was arrested by large-scale grouting, re-setting of the dislocated and fallen stones and pointing. Similarly, in the Lingaraja temple, parts of the *deul* and *jagamohana* were made watertight. The dislocated *amalakas* and *kalasas* of two minor shrines in the compound were re-set in their proper positions and the cracks grouted. In the Rajarani temple, a large number of fallen stones of the cell over the *garbha-muda* were re-set in their proper places and grouting done on a large scale. The Meghesvara temple, which had been profusely leaking, was thoroughly repaired by grouting and re-setting of dislocated stones. The compound-wall of the Ananta-Vasudeva temple, which had been in a state of collapse, was strengthened by the re-setting of the loose stones. The floor of the Markandeyesvara temple was paved with stone flags.

74. SAHASRALINGA TANK, BHUBANESWAR, DISTRICT PURL—The open joints of the stones of the steps around the tank were pointed with suitably-coloured cement-mortar.

75. CAVES, KHANDAGIRI-UDAYAGIRI, DISTRICT PURL—The sculptured facade of the Rani-nur cave had been exposed to sun and rain, with the result that the sculptures were getting obliterated. To arrest this the scarped edge immediately above the sculptured frieze was provided with mass cement-concrete, anchored into the natural rock by copper pins. The course of rain-water was diverted by the provision of drains. Three sculptures by the side of the Lalatendukesari cave were saved from the onslaught of rains by the provision of a stone *chhajja.* A large number of cracks and crevices on the tops of the caves admitting rain-water into the caves were grouted and concreted.

76. SUN TEMPLE, KONARAK, DISTRICT PURI—In implementation of the recommendations of the Konarak Temple Committee, a major part of the terracing over the wall-tops, with a mixture of ironite as the waterproofing medium, was completed. The boulders and stones lying in the compound were cleared so as to make the precincts presentable. During the operation was exposed a fairly large brick-built well, which yielded a chlorite image of Ganesa at a depth of 15 ft. from the surface. The whole of the northern and parts of the western and eastern compound-walls were provided with coping.

Tripura

77. CHATURDASA-DEVATA TEMPLE, UDAIPUR.—Following the clearance of jungle last year *(1956-57,* p. 49), the monument was subjected to special repairs this year (pl. CIV). The brickwork, damaged and missing at many places due to the growth of trees into the structure, was made good with old bricks of the original size. The roots of the trees were eradicated and the cavities filled in. The roofs of the temple and the *mandapa* were re-terraced after the removal of the patches of old terrace. The domes were plastered, the gaping cracks filled in and the open joints made watertight. The compound and the floor of the temples were cleared of debris and brick-bats and the area encompassed by the compound-wall dressed up with a slope away from the temple after a large-scale excavation of heaps of earth and filling in of the pits. Similar large-scale repairs, including the renewal of the flooring, were done to the Lakshmi-Narayana shrine standing by the side of the main temple.

West Bengal

78. DAMODAR TEMPLE, SURI, DISTRICT BIRBHUM—The damaged terracing of the platform, on which the temple stands, was renewed and pointing done to it.

79. TOMB OF BEHRAM SAKKA, BURDWAN.—The roof of the porch was re-terraced and the surface of the tomb replastered.

80. ICHAI GHOSH TEMPLE, GAURANGAPUR, DISTRICT BURDWAN.—Deep-rooted trees growing on the top of the temple were uprooted and the consequent damages made good. . The top and the sides of the pinnacle were made watertight.

81. BRINDAVANACHANDRA THAKUR'S MATH, GUPTIPARA, DISTRICT HOOGHLY.—Special repairs to the group of four temples in the compound were taken up. In the Ramachandra temple, the items of repairs completed were the removal of vegetation, re-laying of lime-concrete after picking up the damaged terracing, recessed pointing in the joints of the terracotta plaques in the facade of the *sikhara* after raking out old mortar, plastering over the terrace at the base 'of the *sikhara,* renewal of the missing moulded work in plain brickwork in the decorative cornice of the *sikhara,* laying of a new floor to replace the damaged one and repairs to the cracks on the roofs. The cracks in the platform of the Brindavanachandra temple were also attended to. Eradication of the deep roots of trees from the roof of the Krishnachandra temple and mending of the consequent damages were effected. The precinct was cleared of jungle. The work is in progress.

82. GROUP OF MONUMENTS, GAUR, DISTRICT MALDA.—The wall-tops of the Chamkati mosque, Tatipara mosque and Dakhil-Darwaza were made watertight. In the Baraduari mosque, repairs to the concrete of the domes and floor of the corridor were done. Stagnation of rain-water around the Lukachuri and Chika mosque was stopped by earth-cutting with a proper slope. The damaged mouldings in the south-east corner of the Gumti gate were renewed.

83. GROUP OF MONUMENTS, PANDUA, DISTRICT MALDA.—In the Qutb-Shahi mosque, the floor was renewed and the top of the boundary-wall replastered. In the Ek-lakhi tomb, the missing parts of the moulded brickwork were renewed and stonework at the entrance in the Adina mosque was re-set.

84. TOMB AND MOSQUE OF MURSHID QULI KHAN, KATRA, DISTRICT MURSHIDABAD.—Katra no. 46 was cleared of debris and strengthened by the rebuilding of the fallen portions of the walls, arches, squihches, doorway and dome. The work of restoration of missing parts of two domes, which alone, of the five original domes, exist, though only in halves, is in progress.

85. TOMBS OF ALIVARDI AND SIRAJU'D-DAULA, KHOSHBAG, DISTRICT MURSHIDABAD.—The repairs were mostly concentrated on the damaged gate and the compound-wall and included the replacement of missing brickwork, renewal of old flooring, plastering of the coping and eradication of trees.

86. PALPARA TEMPLE, CHAKDA, DISTRICT NADIA,—Brickwork, plain and moulded, was replaced on the necessary parts of the facade of the temple.

SOUTH-EASTERN CIRCLE

Andhra Pradesh

87. VIRABHADRA TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.-The roofs of the front *dalan* on the north and left of the main entrance and of the *yaga-sala* on the north-east corner of the compound were made watertight by the laying of concrete in combination-mortar with proper slopes. The roof of the *vahana-mandapa* and the rear *gopuram* were also similarly treated. The tops of the compound-walls on the east and north to the left of the main entrance, on the exterior walls of which there are inscriptions, were made watertight with concrete. The compound-wall in cut-stone masonry all round the monolithic bull, Basavanna, with gateway and steps, was completed.

88. LOWER AND UPPER FORTS, CHANDRAG1RI, DISTRICT CHITTOOR.—The Outer casing wall of the gateway of the lower fort was reconstructed, together with the gaping portion of the interior casing wall, with proper bond-stones and the hearting filled in with lime-concrete for proper strength and distribution of weight. In addition, the wall-tops were re-laid in accordance with the original, with base-stones connecting the inner and outer casing walls.

89. SAUMYANATHASVAMI TEMPLE, NANDALUR, DISTRICT CUDDAPAH.—Large-scale repairs to this Chola temple were carried out: re-laying the roofs of the *mandapas* in concrete, re-setting the stone flooring in proper order and making watertight the damaged compound-wall were among the more important items of repairs.

90. FORT AND GATEWAY, SIDDHAVATTAM, DISTRICT CUDDAPAH~—A portion of the fort-wall, 35 ft. long, adjoining the main entrance in the east had fallen down about seven years ago, and all the fallen material was lying on the site. This breach in the fortification abutting the entrance, which has a brick *sikhara* on one side and a pillared *mandapa* on the rear, had not only deprived the entrance-gateway of its beauty but was also likely to cause further collapse. The re-construction of the breached wall was taken up and completed to a height of 15 ft. from the foundation.

91. BUDDHIST REMAINS, AMARAVATI, DISTRICT GUNTUR.—Part of the work of providing a barbed-wire fencing all round the site with an iron gateway was completed.

92. FORT, GOLCONDA, DISTRICT HYDERABAD.—The structures, especially the first floor of the *mahals,* were cleared of debris and exposed to view. The top roof of the Bhagmati palace was reconstructed with a proper gradient to stop the leaks in the roof. Cut-stone spouts were provided to the roof for the drainage of. water. The broken and exfoliated plasterwork was filleted.

93. CHAR-MINAR, HYDERABAD.—The plastering on the floor, damaged in patches, was partly restored to its original form. The steps in the *minors* were re-set with the flagstones wherever they were wanting.

94. BELFRY COMPOUND, BANDAR (MASULIPATNAM), DISTRICT KRISHNA.—The Belfry platform was repaired and damages in the plaster were made good. The garden inside the compound, which is one of the best in the locality, was improved and fine turf laid. The compound was provided with barbed-wire fencing over the low compound-wall to prevent cattle jumping over it.

95. DUTCH CEMETERY, BANDAR (MASULIPATNAM), DISTRICT KRISHNA.—*Morum* pathways to the individual tomb-stones were provided. The damaged and fallen compound-wall was rebuilt and restored.

96. ROCK-CUT CAVE-TEMPLES, MOGALRAJAPURAM, DISTRICT KRISHNA.—As leakage was noticed in the upper cells of the caves, a dwarf-wall was provided for diverting the rain-water on the open roof of the cells and a catch-water drain was cut to lead the water away from the top of the caves.

97. FORT, ADONI, DISTRICT KURNOOL.-The gateways of the fort were underpinned in their basement and the top made watertight by fresh concrete to replace the damaged one.

98. KALYANA-MANDAPAM, UDAYAGIRI, DISTRICT NELLORE.—The roofs of the *mandapas* in the compound were rendered watertight by the re-laying of the surface with

concrete in combination-mortar, shingle being used as in the original. The old flooring of the Kalyana-mandapam was redone after the removal of the sunken old slabs, re-laying them and pointing the joints with combination-mortar.

99. KRISHNA TEMPLE, UDAYAGIRI, DISTRICT NELLORE.—The joints of the salt-affected brickwork of the *sikhara* over the sanctum were pointed with combination-mortar to match with the old surface. The damaged roof of the *mukha-mandapa* was rendered watertight with a fresh layer of shingle-concrete combination-mortar after the removal of the old one. The wide joints and cracks in the cut-stone walls were filled with combination-mortar and the surface recess-pointed to match with the old surface.

100. RANGANAYAKULA TEMPLE, UDAYAGIRI, DISTRICT NELLORE.—The Cut-Stone beams over the gateway of the eastern entrance of this Vijayanagara temple, originally built on a grand scale, had developed many cracks, the concrete of the terrace of the entrance had lost its grit and vegetation grew profusely. The old concrete was removed and the surface re-laid with fresh concrete to render the top waterproof. The damaged top of the brick *vimana* over the southern entrance-gateway with a part of the inside facing in brickwork, in the form of corbel without bonding with the core behind, had disappeared leaving the extant part overhanging. The patches were underpinned with new brickwork to match with the old facing-work.

101. BUDDHIST REMAINS, SALIHUNDAM, DISTRICT SRIKAKULAM—The disturbed stones of the two big *stupa-chaityas* were re-set in order, thereby restoring the *stupas*, to their original shape. The damaged and pitted facing of the large brick retaining wall in front of the Buddha-*chaitya* was underpinned with old bricks. The stone-and-concrete pavement of the main pathway leading to the Mahastupa-chaitya, etc., which had been scoured and disturbed by rain, was re-set, grouted and bonded in cement-concrete, matching in colour with the exposed face of the old concrete, present in small patches here and there in the pitching.

102. BUDDHIST REMAINS, . SANKARAM, DISTRICT VISAKHAPATNAM.—The damaged expanded-metal shutters at the two cave-temples were replaced by strong automatically-closing type of expanded-metal shutters in flat iron frames. The top layers of the brick *stupas* and monastic cells were re-set and provided with *morum*-coping.

103. RAMAPPA TEMPLE, PALAMPET, DISTRIST WARANGAL.—The roof of the main *mandapa* was re-surfaced with fresh concrete in slope, and the gaps formed in the inner *sikhara,* due to the damaged wooden frame, were plugged and repaired.

104. FORT, WARANGAL—Scattered sculptures were re-arranged in the Kush-Mahal. The top of the *mandapa* of the Ekasila temple was reconcreted with a gradient. The huge flooring stones of the temple of Venkatesvara were re-set with a proper level.

105. BUDDHIST REMAINS, ADAMALLI, DISTRICT WEST GODAVARI.—Repairs to the sculpture-shed were carried out.

Bombay

106. TEMPLE, ARMORI, DISTRICT CHANDA.—A portion of the embankment was formed on all the three sides abutting the tank to prevent the tank-water from touching the temple.

107. FORT, BALLARPUR, DISTRICT CHANDA.—The inner sides of the eastern and northern fort-walls were repaired after a large-scale clearance of heavy debris all along. Similar repairs are proposed for the bastions also.

108. FORT-WALLS, CHANDA—The vegetation-growth was removed and at the places of such removal fresh mortar was plugged in to stop the re-emergence of vegetation.

Madhya Pradesh

109. GATEWAYS, RATANPUR, DISTRICT BILASPUR.—Scrub-jungle, grass, etc., were cleared from the gateways to keep the monument in a tidy condition.

SOUTHERN CIRCLE

Kerala

110. FORT ST. ANGELO, CANNANORE.—Shutters were provided to the doors of the cells. The wooden bridge, doors and trelliswork of the barracks were repainted, the guns were oiled and a breach near the moat was made good.

111. MATTANCHERY PALACE, COCHIN.—Brass railings were provided around the paintings in the central hall in the second floor to keep the visitors off the paintings.

112. ST. FRANCIS CHURCH, COCHIN.—The replacement of the tiles of the vestry, painting of the vestry and other parts and repairs to the eaves-gutters were carried out.

113. KUDAKALLUPARAMBU, CHERAMANANGAD, DISTRICT TRICHUR—Barbed-wire fencing was erected on the eastern side of the site to prevent cattle from damaging the megalithic structures.

114. ROCK-CUT CAVE, KAKKAD, DISTRICT TRICHUR.—The coping of the compound-wall was plastered.

115. ROCK-CUT CAVE, KANDANASSERI, DISTRICT TRICHUR.—Barbed-wire fencing was erected to protect the cave.

Madras

116. SHORE TEMPLE, MAHABALIPURAM, DISTRICT CHINGLEPUT.—Some parts of the walls of the monument were grouted under pressure with hydraulic lime.

117. NITYAKALYANA-VARAHASVAMI TEMPLE, TIRUVADANTHAI, DISTRICT CHINGLEPUT.—The dilapidated stone flooring was re-laid with a proper slope and the doors were painted.

118. FORT ST. GEORGE, MADRAS.—The decayed wooden doors, windows and ventilators in Block XXXVI were removed and replaced by new ones in accordance

with the originals. The walls of the portion of the building occupied by the Museum were decorated with oil- and emulsion-paints following the old specifications.

119. OLD TOWN-HALL, TONDIARPET, MADRAS.—In collaboration with the Corporation of Madras, the walls were extensively plastered and underpinned to make the locality beautiful for a terrace-garden.

120. ROCK-FORT, PALLAPATTI, DINDIGUL, DISTRICT MADURAI.—The *mandapa* on the south side of the main temple at the top of the hill-fort was repaired with new stone lintels in place of the missing ones, and roofing slabs were provided in the front side of the *mandapa.* The flooring was also repaired with lime-concrete.

121. ROCK-CUT CAVE-TEMPLE, TIRUPPARANKUNRAM, DISTRICT MADURAI.—The stone steps leading to the cave-temple were dressed uniformly, so that now they appear neat and tidy. The retaining walls of the grilled enclosure in front of the temple were plastered. The top-surface of the stone platform leading to the entrance of the temple was dressed up. The well at the entrance was provided with a stone beam for a new iron pulley.

122. DELHI GATE, ARCOT, DISTRICT NORTH ARCOT.—The brickwork was underpinned and the gate-wall plastered. A small bridge was constructed with cut-stone slabs across the channel to facilitate access to the monument.

123. VEDANARAYANA-PERUMAL TEMPLE, PUDUPPADI, DISTRICT NORTH ARCOT.—The worn-out joists in the *garbha-griha* were renewed and the flooring in the *garbha-griha* and *ardha-mandapa* was re-set. The *mukha-mandapa* was provided with steps. The sides of the channel were protected with dry-rubble packing. Accretions of earth were removed.

124. FORT, VELLORE, DISTRICT NORTH ARCOT.—The terrace of the main gateway was made watertight, the brick portion of the rampart-walls was underpinned and the pathways were gravelled.

125. JALAKANTESVARA TEMPLE, VELLORE, DISTRICT NORTH ARCOT.—Steps were constructed in cut-stone for the *dalans* in the inner side. Expanded-metal frames were provided to combat the bat-nuisance. The walls of the second *gopuram* were plastered. Wood-preservative was applied to the massive door and other woodwork in the temple.

126. GROUP OF MONUMENTS, GINGEE, DISTRICT SOUTH ARCOT.—General maintenance, like the removal of vegetation, patch-plastering to the walls and floors, underpinning and reconstruction of rubble-masonry wherever required, was attended to.

127. KALYANA-MAHAL, GINGEE, DISTRICT SOUTH ARCOT.—The old broken concrete in the *dalans* was carefully removed and the floor was re-laid with concrete.

128. BRIHADISVARA TEMPLE, TANJAVUR—The buried portion of the pierced compound-wall enclosing the temple was exposed on the north-eastern side as well in continuation of the work done in the previous years *(1955-56,* p. 43), the operation bringing to light further Chola inscriptions on the wall-surfaces. The trenches all round the outside compound-wall were gravelled and made into a good pathway. The modern walls outside and inside the temple-corridors were removed, so that the original Chola structures now clearly stand out.

129. BRIHADISVARA TEMPLE, GANGAIKONDACHOLAPURAM, DISTRICT TIRUCHIRAPPALLI.—The broken stone beams in the *amman* shrine were replaced by new beams dressed in conformity with the old ones. The scattered and loose stones fallen from the front *gopuram* were removed and collected outside.

130. PALIAVA ROCK-CUT TEMPLE, KUDUMIYAMALAI, DISTRICT TIRUCHIRAPPALLI.—The fallen portions of the periphery-wall were re-erected and a gate provided at the entrance. The approach-way was gravelled and the ugly undulations around the temple-premises were levelled. The modern brick walls partitioning the front *mandapa* of the Siva temple were removed.

131. ROCK-CUT SIVA TEMPLE, KUNNANDARKOVIL, DISTRICT TIRUCHIRAPPALLI.—The stone flooring in front of the monument was re-laid properly from the entrance and a flight of steps was cut into the rock in front of the doorway in the compound outside. The undulations in the front of the monument were levelled.

132. ROCK-CUT JAINA CAVE-TEMPLE, SITTANNAVASAL, DISTRICT TIRUCHIRAPPALLI.—A platform was erected in front of the cave to present a decent appearance and steps were built in stone at necessary places to facilitate the climb on the hillock. The caves containing early Brahmi inscriptions were also made easily accessible by a path to the hill-top.

133. KORANGANATHA TEMPLE, SRINIVASANALLUR, DISTRICT TIRUCHIRAPPALLI.—Two carved broken stone beams in the front *mandapa* of this important early Ghola temple were replaced by new ones.

134. BHAKTAVATSALA TEMPLE, SHERMADEVI, DISTRICT TIRUNELVELI.—All the doors of the temple were painted. Expanded-metal fittings were provided to the two openings in the *gopuram* and frames of the same material were fixed at the southern and northern *dalans* to prevent the entry of bats.

Mysore

135. OLD DUNGEON AND FORT-GATEWAY, BANGALORE.—A portion of the north-east corner of the fort-wall, which had fallen on account of heavy rains in 1956-57, was re-built in the original style with old material as far as possible (pl. CV).

136. ANANTASAYANA TEMPLE, ANANTASAYANAGUDI, DISTRICT BELLARY.—The removal of debris from inside the southern part of the monument is in progress; the removed boulders are being neatly stacked away from the monument. Bat-proof netting was provided to the two ventilators of the *vimana* and the three entrances of the main shrine. The old concrete on the terrace of the *mukha-mandapa* was removed.

137. TIPU SULTAN'S UPPER FORT, CITADEL AND NAGALACHERUVU, BELLARY.—Repairs to the steps were completed. The scattered stones were removed and stacked neatly. Thick jungle with big trees, causing damage to the fort-walls, was removed.

138. GROUP OF MONUMENTS, HAMPI, DISTRICT BELLARY.—The road and pathways leading to the monuments were widened. The pathways were gravelled wherever necessary to meet the needs of the ever-increasing vehicular traffic. Patch-plastering and grouting and other repairs were done to the Hazara-Rama temple, Queen's Bath, Zanana enclosure, Kadalaikal Ganesa, Chandrasekhara, Sarasvati, octagonal pavilion,

etc. The floors of the *mukha-mandapa* and *garbha-griha* of the Achyutaraya temple were pointed and the leaky terrace was made watertight.

139. AMRITESVARA TEMPLE, AMRITAPURA, DISTRICT CHIKMAGALUR.—The *mandapa* was made watertight and the granite stone steps and. shutters of the shrine were attended to.

140. VIRANARAYANA TEMPLE, BELAVADI, DISTRICT CHIKMAGALUR.—The bench stones all round the Venu-Gopala and Narasimha shrines were re-set, the floor was recess-pointed and the shutters of the three shrines were repaired.

141. FORTRESS AND TEMPLES, CHITALDRUG.—Patch-plastering, grouting, jungle-clearance and other minor repairs were carried out.

142. RAJA'S SEAT, MERCARA DISTRICT COORG.—The floor was concreted and the monument was given a grey wash.

143. GROUP OF MONUMENTS, SRAVANABELGOLA, DISTRICT HASSAN.—The entire terraces of the temple and the *mandapa* at the top of the hill were made watertight by the removal of the old porous concrete and laying of two courses of flat tiles in cement-mortar mixed with 5 p.c. crude oil over a 4-in. thick brick-jelly concrete with a good slope, roughly plastered over with two coats of lime-mortar mixed with myrobalans *(Terminalia chelabala).*

144. GROUP OF MONUMENTS, SRIRANGAPATNA, DISTRICT MANDYA.—In the Daria-daulat-Bagh the dislocated stones in the *ghat* leading to the river Kaveri were removed and re-set and the joints pointed. The zinc-sheet roofing over the painted ceiling all round the corridor was removed and refixed with a greater overlapping to increase the slope of the roof by about 9 in. at the top. After the removal of the zinc sheets, the entire framework of teakwood was cleaned and painted with two coats of wood-preservative. The worn-out teakwood scantlings were replaced wherever necessary. This work has effectively protected the gorgeous painted surfaces from the rain-water dripping through the roof. The fallen portion of the partition-wall of the pond inside the Juma-Masjid was conserved by the reconstruction of the portion in random-rubble plastered over with lime-mortar. The leaky terrace of the main *mandapa* in the Ranganathasvami temple was made watertight. The peeled-off portions of the plastering in the merlons all over the temple-wall were plastered over with lime-mortar. Patch-plastering was also attended to in the terraces of the temple-kitchen and the bottom *vimma* of the shrine of the goddess. The leaky portions of the terrace and of the of the *chhajja* of the *Nagarkhana* were made watertight.

145. RAMESVARA TEMPLE, NARASAMANGALA, DISTRICT MYSORE.—The modern brick partition-wall between the pillars of the Sapta-matrika-mandapa was dismantled and the debris cleared to allow more light inside the *mandapa.* For purposes of safety, expanded-metal frames were fixed to the door. The leaky terraces of the main *mandapa* and that of the Sapta-matrika-mandapa were made watertight by the removal of the old porous and dead mortar and relaying of fresh concrete in lime-mortar, over which were laid two courses of flat tiles in cement-mortar mixed with crude oil, the top roughly finished with suitably-coloured lime-mortar. The cracks in the *vimana* were grouted with liquid lime-mortar and the surface finished to match, the old work.

146. KESAVA TEMPLE, SOMANATHAPUR, DISTRICT MYSORE.—The irregular floor-stones in the *prakara* round the main shrine were removed, cut and dressed to

regular shapes and re-used for the flooring of the *dalans* on the south, west and north over a 3-in. thick bed of sand, the joints being pointed with coloured mortar. The flooring of the *prakara* itself was laid with newly-cut granite slabs of size, 3 to 4 in. thick, over a concrete-bed with a good slope towards the original outlet. The terraces of the corridors all round were dismantled by the removal of the old concrete for a layer of fresh concrete. The work is in progress.

147. JAMALABAD FORT, NADA AND LAILA, DISTRICT SOUTH KANARA.—Heavy jungle-clearance was done. The guide-lines were marked and the steps were numbered in black and white paints.

148. FORT, MADHUGIRI, DISTRICT TUMKUR—Steps in random-rubble were constructed in front of the ninth gate and near the fifth gate for easy ascent. The brick parapet-wall between the fifth and sixth gates was rebuilt to a length of 140 ft. in accordance with the original.

SOUTH-WESTERN CIRCLE

Bombay

149. ROCK-CUT CAVES, AJANTA, DISTRICT AURANGABAD.—A thorough and systematic programme of conservation of the caves has been chalked out: this includes items like stopping water from flowing over the facade of the caves by the provision of rock-cut drains and drip-courses, grouting cracks'on the surface with suitably-tinted cement-mortar, treating the exfoliated portions, restoring weathered and broken pillars in reinforced cement-concrete after the original models and dismantling masonry-supports provided in the past and fashioning them in reinforced cement-concrete in imitation of rock-cut pillars. For such thorough treatments the caves lying at the western end of the valley, Caves 29 to 21 were taken up. The cell attached to Cave 27 was partially reconstructed to protect the enshrined Buddha image which had been considerably damaged in the past. The image itself was treated by the filling in of all cracks and refixing of damaged portion by means of pins and dowels. The ashlar-masonry pillars in Caves 21, 24 (pls. CVI and CVII) and 26 were replaced by reinforced-concrete pillars to match the existing ones. Similarly, the decayed and overhanging portions of the jambs, walls, pillars, ceilings, etc., of Caves 21 (pl. CVIII), 22, 25 and 27 were treated after providing copper pins and clamps wherever necessary. The decayed rock-surface was chiselled off in many caves and the hard rock covered with concrete simulating the old surface. Rock-cut drains were provided over Caves 21 to 29 to prevent rain-water from coming down over the facade. In order to provide easy access to the newly-discovered cave (15A) a flight of steps was constructed near Cave 15. The portion of the retaining wall in front of Caves 13 to 15, damaged due to the fall of boulders from the top, was also repaired.

150. BIBI-KA-MAQBARA, AURANGABAD.—The decayed stone *chhajja* below the ornamental work of the miniature dome to the south-west of the main dome was replaced with new stones of the same kind. Fine lime-plastering on the walls, wherever the original plaster is missing, is in progress. The damaged stones of the pavement and the dwarf-railing in front of the eastern *baradari,* used as museum, were replaced with new stones with similar workmanship.

151. ROCK-CUT CAVES, AURANGABAD.—For easy access to the caves of the second group, a proper pathway was laid and steps provided in front of Caves 6 and 9.

152. FORT, DAULATABAD, DISTRICT AURANGABAD.—Beside the usual clearance of debris and jungle-growth, the leaking roof of the Kala-kot was repaired and made watertight along with the fortification-walls near it. The Naya-darwaza was also similarly treated.

153. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—The programme of work at Ellora has been *planned, mutatis mutandis,* on the same lines as at Ajanta. Accordingly, the group of caves at the southern end, from Caves 1 to 9, has been taken up for thorough repairs. The ceiling of Cave 1, where it joins the north wall, had developed a crack, and, as a precautionary measure against any untoward development, a massive concrete wall, with a surface resembling the rock, was erected as a support. The heavy mouldings at the plinth of the lateral galleries of Cave 2, which had badly weathered, were repaired in reinforced cement-concrete and finished to match with the surroundings. The damaged pillars and those previously repaired in ashlar-masonry of the cave, as also those of Caves 6 (pl. CIX) 7, 8 and 9, together with the weathered portions of jambs and walls, were repaired and fashioned with the same material. Wide cracks and joints in the facades of the caves were filled in to stop further disintegration due to water-action. ' To divert rain-water coming on the facade of the caves, drains were cut into the rocky roof, as a result of which leakage of water through the joints of rock has been considerably minimized. The inscription of Dantidurga, carved on the wall of the western porch of the *mandapa* in front of Cave 15, so long exposed to weather due to the fall of the roof and the south-western supporting pillar, was protected by providing a roof and the pillar in reinforced concrete (pl. CX).

The narrow culverts in front of Cave 14 and between Caves 11 and 12 were widened for easy traffic. For easy access rock-cut steps were provided between Caves 22 and 29.

The clearance of debris in front of Cave 25 revealed unique features. The surface, thought to be the ground-level so far, turned out to be the floor of a high platform reached through an entrance, with a damaged panel of Gaja-lakshmi on the back wall, leading to a flight of rock-cut steps, to the left. The clearance further brought to light in the plinth an excavated cell with three pits, apparently an unfinished scheme, in the floor and a porch in front of it at a lower level.

Fine repairs to the sculptures were *pari passu* continued: the cracks and rock-joints across the sculptures in Caves 2 to 4 were repaired with tinted mortar and the overhanging and loose portions were secured by inserting copper pins and clamps. The wide joints across the elephant-caryatids in the plinth of the main temple and the *dhvaja-stambhas* in the plinth in the courtyard of Cave 16 were filled in. The Mahishasura-mardini panel in Cave 17 was also repaired.

154. AURANGZEB'S TOMB, KHULDABAD, DISTRICT AURANGABAD.—The damaged inlay-work of the inscribed tablet was repaired at Agra with semi-precious coloured stones and the tablet restored to its original place. Repairs to the broken marble *jali*-work are in progress. The decayed ornamental plasterwork on the facade of the gate was repaired with reproductions of the original designs.

155. ROCK-CUT CAVES, PITALKHORA, DISTRICT AURANGABAD.—Clearance in front of the *chaitya-* and *vihara-caves* revealed some unique features and sculptures (above, p. 65). Further clearance is in progress.

156. ELEPHANTA CAVES, GHARAPURT, DISTRICT KOLABA.—In pursuance of the decisions previously arrived at (*1956-57,* p. 57) the following measures were taken in Cave 1: (1) grouting the fissure under pressure through holes bored into the roof by a rotary borer down to varying depths; (2) laying on the roof mass-concrete with a proper slope of an average thickness of 6 in. mixed with a waterproofing compound; and (3) covering the concrete with a layer of earth. At the joints of the different sectors of concrete duly-kinked copper plates were provided to drain out water which might otherwise percolate through the joints. Observations during and immediately after the monsoon show that as a result of these measures leakage has been reduced but not completely stopped. The whole problem is being reviewed in the light of the observations and implications.

157. PATALESWAR CAVES, POONA.—All ruts and holes in the floor were repaired. The damages in the compound-wall were made good.

158. SHANWARWADA, POONA.—The wall-tops were made watertight and the existing plinths of walls pointed. Regular pathways were laid to enable visitors to go round the ruins. Lawns (below, p. 113) and an all-round tidying-up have provided a pleasant setting to the ruins.

Mysore

159. DURGA TEMPLE, AIHOLI, DISTRICT BIJAPUR.—The wide joints in the roof were filled in. The work of providing roof-slabs to the *mandapa,* which is open to sky, is in progress.

160. GROUPS OF MONUMENTS, BADAMI, DISTRICT BIJAPUR.—The temples in the north fort were treated by way of making the leaking roofs watertight and pointing wide joints.

161. GROUP OF MONUMENTS, BIJAPUR.—The pavement of the courtyard of Juma-Masjid was pointed with suitable mortar. The tomb of Jahan Begam and the mausoleum of 'Ali II received attention and the ends of standing walls and arches were made watertight.

WESTERN CIRCLE

Bombay

162. KANKARIA TANK, AHMADABAD.—The inlet to the tank received special repairs by way of providing stone railing on the terrace of the inlet in portions where it was missing. The staircase leading to the terrace was repaired and the missing pilasters in the interior of the inlet replaced.

163. KHAN MASJID, DHOLKA, DISTRICT AHMADABAD.—This mosque, built by Alif Khan Bhulsai, the commander of Mahmud Begarha's army in the fifteenth century, was conserved by the removal of decayed concrete of the floor, which brought to light an earlier floor in the prayer-hall.

164. KHAN TANK, DHOLKA, DISTRICT AHMADABAD.—The eastern ramp and the parapet-walls, which had been in a dangerously leaning state, received further repairs (*1956-57,* p. 58).

165. MALAV TANK, DHOLKA, DISTRICT AHMADABAD.—The ramps and flights of steps of the tank were repaired in continuation of last year's work *(1956-57,* p. 59). Rugged stones with proper bedding were provided in the western ramp. The sunken steps are being re-set in their original position.

166. TOMB OF SYED USMAN, USMANPURA, DISTRICT AHMADABAD.—The floor was provided with fresh lime-cement-concrete mortar.

167. JUNAGADHI TEMPLE, VASAI, DISTRICT AMRELI.—The temple was further repaired *(1956-57,* p. 59) by the re-setting of the uneven stone flooring and provision of drains.

168. HAZIRA, BARODA.—The Hazira, the tomb of Qutbu'd-Din, tutor of Salim, was further *(1956-57,* p. 58) repaired by the underpinning of the brickwork of the corridors and the underground cells in the high plinth of mausoleum.

169. FORT, DABHOI, DISTRICT BARODA.—The pillared pavilions flanking the Baroda gate in the eastern fort-wall, famous for the sculptures on its brackets, capitals and pillars, were provided with stone pavement to prevent the seepage of rain-water. The bulging ashlar-masonry in the inside wall of the Hira gate was rebuilt in plumb and the roof rendered watertight.

170. ROCK-CUT CAVES, TALAJA HILL, DISTRICT GOHILWAD.—The caves were cleared of an enormous amount of debris, in the course of which two double-storeyed caves were discovered; they are being opened up. In the midst of the debris on the roof of one of the caves a brick-structure of the third-fourth century was uncovered. A clay *bulla* of a Kshatrapa king and sherds of the Red Polished Ware were also brought to light.

171. GUPTA TEMPLE, GOP, DISTRICT HALAR.—The temple received further attention *(1956-57,* p. 59). After excavation around the plinth, proper drainage was provided to permit an easy flow of water. The sculptures in the plinth were fixed in their proper positions and underpinning was carried out wherever necessary.

172. JAMI'-MASJID, CAMBAY, DISTRICT KAIRA.—This earliest and largest mosque in Gujarat stood in need of extensive repairs. Some of the overhanging pillars and walls had previously been supported by masonry *(1956-57,* p. 58). This year, the re-setting of the stone pavement in the central courtyard with proper bedding to prevent the percolation of rain-water into the plinth was taken in hand. The unsightly iron screens and wooden frames in the perforated window-screens were replaced by carved stone screens in accordance with the original designs.

173. SUN TEMPLE, MODHERA, DISTRICT MEHSANA.—The reservoir known as Surya-kund in front of the temple had suffered heavy damages owing to the sinking of the flight of steps and the numerous miniature shrines standing over them. The sunken steps were removed and re-set in position on a concrete-bedding and some of miniature shrines were rendered watertight by grouting, pointing and rebuilding of the bulged portions. In course of the removal of the heavy stones from the roof of the *nritya-mandapa* of the main temple, it was observed that during the repairs carried out in the past loose lintels and brackets had been heaped up in a haphazard manner on the roof. They were carefully" removed and the architectural members in the circular opening of the roof were properly supported on the core consolidated by grouting and plugging hollows. The plinth of the *torana* standing in the north-east corner of the

main shrine was fully exposed to view by the excavation of the adjoining area and a slope was provided to drain off water from the area. A shed to house the loose sculptures is being constructed.

174. SAHASRALINGA TANK, PATAN, DISTRICT MEHSANA.—The core of the parapet-wall behind the pathway of the brick-built silt-chamber known as Rudrakupa was underpinned and the ashlar-facing was re-set in position by copper clamps. The flight of steps on the western embankment of the east-west channel was provided with a bedding in brickwork in accordance with the original method of construction.

175. SIVA TEMPLE, BAVKA, DISTRICT PANCHMAHALS.—The dislodged door-jambs of the *gavbha-griha* and the pillars of the *sabha-mandapa* of this Chaulukyan monument of the twelfth century were re-set. The carved horizontal members of the plinth of the *garbha-griha* and *sabha-mandapa* were refixed to their original positions.

176. HELICAL WELL, CHAMPANER, DISTRICT PANCHMAHALS.—This brick structure, built during the time of Mahmud Begarha, was underpinned, as the bricks had worn out by the action of salt.

177. SHAHR-KI-MASJID, CHAMPANER, DISTRICT PANCHMAHALS.—The north wall of the well-known mosque, built by Mahmud Begarha, had suffered damage by percolation of rain-water, as the ashlar-facing had collapsed, leaving the core exposed. Fresh ashlar-masonry was erected after the consolidation of the core.

178. ROCK-CUT CAVES OF KHAPRA KODIA, JUNAGADH, DISTRICT SORATH.—The roofs of the caves were found to be leaking owing to depressions and "fissures in the rock. The debris lying on the roof was removed and the fissures grouted and hollows plugged in lime-cement concrete. Steps were provided and drains are being dug out to prevent the stagnation of water.

Rajasthan

179. GROUP OF TEMPLES, ARTHUNA, DISTRICT BANSWARA.—Of the three groups of temples, the main group, Nilakanthesvara-Mahadeva, was taken up for repairs. Jungle which had enveloped the small but beautiful shrines was cleared. Further work, including the construction of a sculpture-shed, is in progress.

180. MAHAKALA TEMPLE, BIJOLIA, DISTRICT BHILWARA.—The dislodged stones of this massive edifice with aliigh *sikhara* and fine sculptures on the facade were re-set in position. Cracks were grouted and the seepage of water into the core' was stopped. The joints in the masonry of the Mandakini-kund were grouted and pointed.

181. UTTAMA-SIKHARA PURANA ROCK-INSCRIPTION, BIJOLIA, DISTRICT BHILWARA.—A shed was provided over the inscription after the existing closed and narrow brick structure.

1821 GROUP OF TEMPLES, BADOLI, DISTRICT CHITORGARH.—The temples at Badoli received further repairs *(1956-57,* p. 60). The sunken steps of the *kund* near the road were restored to position. The roof of the Siva shrine was made watertight and the subsidiary shrines were repaired by the re-setting of the disjointed stones and provision of a pavement around them to prevent percolation of water into the foundations, which is the most urgent problem at these monuments. Sculptures are being arranged for

display in the recently-constructed sculpture-shed. Further work at Sringar Chauri and other monuments, including the building of a culvert across the nullah to provide approach to the main group of temples, will be taken up shortly.

183. GROUP OF MONUMENTS, FORT, CHITORGARH.—The Tower of Victory built by Rana Kumbha in.the fifteenth century to commemorate his victory over the Sultan of Malwa, received special attention (pl. CXI). While the ground near the monument was being cleared, it was found that there were hollows in the rubble-masonry of the foundation of this 78-ft. high tower built on the bed-rock. In order to ensure the safety of the monument and check the erosion of the soil the builders had provided supporting walls on the west and south sides, but it was noticed that the foundation of these walls too was not sound. After a thorough grouting of the cracks and fissures in the foundation, the hollows were plugged with stones of suitable sizes and a 3-ft. wide toe-wall in rubble masonry was built up. The flanking walls were similarly supported.

The Siva temple in the Sati enclosure (pl. CXII) received special repairs by way of underpinning the dangerously overhanging portion of the high plinth in rugged masonry. The *pradakshina-patha* around the sanctum was restored. The beautifully-carved door-jambs were re-set in plumb.

The eastern Sati gate had suffered heavy damage owing to jungle-growth, leakage of water, etc. The massive lintels were found broken and the capitals cracked. The roof had been precariously held in position by props given in dry masonry and the side-walls had developed bulges. Extensive repairs were carried out to this monument. The bulged masonry of the side-walls was taken down and re-set in plumb with the ashlar-veneering securely held. The damaged niches were repaired by the replacement of missing stones and the fixing in position of the dislodged sculptures. The high plinth-walls of the platforms on the western side" were rebuilt in plumb. The cracked brackets and capitals are being replaced by fresh ones, after the completion of which the roof will be attended to.

In Rana Kumbha's palace-complex the side-walls and the three-storeyed rooms flanking the central hall of the heir-apparent's palace were carefully repaired. Half of the dome over the rooms had collapsed, the surviving part dangerously overhanging with the decay of wooden beams, lintels, etc., and the side-walls were supportless. The repairs consisted of the provision of concealed reinforced cement-concrete rings at the two floor-levels in the side-rooms, tied with vertical pillars of the same material, also concealed, inserted at the four corners of the room and the verandah. The fallen portion of the dome was rebuilt, the dome thus restored to its original shape (pl. CXII I). In order to provide a bond between the longitudinal walls and the return-walls a reinforced cement-concrete beam was inserted into the walls. The repairs involved considerable risk but were carried out satisfactorily.

The woodwork in the palace of Padmini was coated with wood-preservative. The garden in the courtyard was extended.

The temple of Kukkutesvara had been made watertight last year *(1956-57,* p. 60). This year the seepage of rain-water into the foundations was stopped by the construction of a pavement around the temple and levelling of the surroundings.

The Rampura house, overgrown with jungle and with some of the walls collapsed, was attended to. After the removal of the jungle and debris the wall-tops were made watertight, the door-jambs underpinned and the roof provided with fresh lime-cement concrete. A proper approach-road was laid.

The other monuments that received attention were : Adbhutanathaji temple

and the smaller shrines standing on the Kukkutesvara tank, which were underpinned; two other temples, the plinths of which were made watertight; and the miniature shrines between the northern Sati gate and Samiddhesvara temple, the dislodged stones of the *sikharas* and door-frames of which were re-set. In the course of the excavation within the Sati enclosure two shrines with beautifully carved door-jambs, assignable to the ninth-tenth century, were uncovered.

184. GROUP OF TEMPLES, MENAL, DISTRICT CHITORGARH.—Heavy leakage of water through the roofs and deep penetration of roots of large trees into the masonry have been responsible for the total collapse of some of the structures and gaping cracks in others. Even approach to the monument is difficult. As a preliminary step for undertaking extensive conservation-measures, the huge trees were cut down and their roots destroyed. The debris was removed and excavation carried out to expose the stone pavements of the courtyard and the plinths of some of the shrines.

185. FORT, KUMBHALGARH, DISTRICT UDAIPUR.—The temple of Bavan Deori, including fiftyone subsidiary shrines in the enclosure, had suffered heavy damage due to jungle-growth and leakage of water. After the removal of the debris of the shrines which had collapsed in' the north-west corner of the temple, the plinths were rebuilt up to the basement of the shrines. Further work is in progress. Similarly, the dislodged stones of the shrines in the south and soutn-west corners were taken down and re-set in position. The roofs of some of the shrines were rendered watertight. The woodwork in the palace known as Badal-Mahal was coated with wood-preservative. Some of the small Jaina temples were attended to by way of clearance of debris and construction of retaining walls to stop erosion of earth around the plinth. General clearance of jungle and repairs to the approach-path were also executed.

186. TEMPLES OF SAS AND BAHU, NAGDA, DISTRICT UDAIPUR.—The dislodged *chhajja-stones* in the temples were re-set and the cracks in the facade grouted. The high plinth with heavy mouldings had sunk due to large-scale percolation of water into the foundation. The facade-stones of the plinth and the pavement were replaced in position. The debris lying'over the roof of the *sabha-mandapa* was removed and the bricks were re-laid in lime-cement mortar. The brick *sikhara* is being underpinned.

CENTRAL CIRCLE

Bombay

187. FORT, BALAPUR, DISTRICT AKOLA.—A retaining wall of uncoursed rubble-masonry was erected in a section to stop a further collapse of the fort-wall.

Madhya Pradesh

188. FORT, LANJI, DISTRICT BALAGHAT.—The upper part of the brick fortification in the area behind the main temple was made watertight and the loose sculptures lying in front of the main shrine were properly cleaned.

189. FORT, DEOGARH, DISTRICT CHHINDWARA.—The collapsed steps of the Moti

tank were repaired and rank vegetation removed from over a considerable area. The approach-road was reconditioned.

190. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.—An important programme of repairs has been initiated for these caves and is being closely followed. The work of clearing the debris lying between Caves 3 and 4 was continued (*1956-57,* p. 61). This large-scale clearance exposed some broken sculptures, noteworthy amongst which is a part of a frieze (pi. CXVI), similar to that existing on the facade of Cave 3. It is likely, therefore, that behind the debris will be found a new cave.

The colossal work of removing from the entire roof-area of Cave 4 the pulverized claystone, at places upwards of 20 ft. high (pl. CXV), which overlies the sandstone strata into which the caves are cut, and acts as a reservoir of moisture over the cave, was continued *(1956-57,* p. 61). A wide crack running along the entire length of the ceiling of the front gallery of Cave 4 was filled in with toned mortar, internally secured and strengthened by copper pins and stone wedges.

191. GROUP OF MONUMENTS, MANDU, DISTRICT DHAR.—The steps leading to Baz Bahadur's palace were exposed to their entire length, thus adding to the imposing view afforded by the entrance. The decayed plaster on the top of the cupolas was removed and a fresh layer applied. The extant tops of the walls were rendered watertight. The bulged portions of the eastern enclosure-wall of Dilawar Khan's mosque were repaired by re-setting; the wall was further consolidated by the filling of holes and voids in the hearting wherever exposed. The marble dome and the side-walls of Hoshang Shah's tomb were rendered watertight by grouting. The leaky roofs of the imposing Jami'-Masjid are being repaired by the grouting of cracks and fissures and renewal of lime-concrete in patches wherever needed. The dislodged finial of the northern portico-dome was rebuilt. The tops of the walls on all the four sides were rendered watertight and the bulged portions of the masonry, notably on the northern side, were rebuilt and the open joints, voids and gaps filled. Further work on this monument is in progress. In the Jahaz-Mahal, the decayed lime-plaster was properly filleted after the pulverized portions over an extensive wall-surface had been raked. The exposed core of the two columns in the Ashrafi-Mahal was consolidated with toned and recessed mortar. The pitted floor of the main portico of this edifice was replaced by afresh concrete floor, while its dome was rendered watertight from above. The long-neglected roofs of Malik Mughith's mosque were made watertight by grouting the cracks and fissures on the terrace. The angle-irons supporting the cracked lintels in different monuments were repainted to avoid.corrosion.

192. JAMI'-MASJID, CHANDERI, DISTRICT GUNA.—The leaky roof of the prayer-hall was rendered watertight by grouting cracks in the extrados of the domes and by the renewal of *golas* (band) at their spring-line. Other repairs to this beautiful mosque comprised toning and recessing the mortar in the joints of the floor-slabs of the southern colonnade.

193. GROUP OF MONUMENTS, FORT, GWALIOR.—The ceiling of one of the apartments surrounding the first courtyard of the Man-mandir palace was provided with a wire-net frame to stop bat-nuisance. Other minor repairs, viz. renewal of concrete and plaster in patches wherever needed, were also attended to. A noteworthy item of repairs was the replacement of cracked lintels in the outhouses attached to the palace. Work is in progress. Approach-roads of the Teli-ka-mandir and Sas-bahu temples were reconditioned by a spread of *morum.* In the rock-cut Jaina colossi, an approach-

road of stone pitching was provided for the caves and images on the Mari-mata side, which were hitherto difficult to reach. Silt-accumulation concealing the lower part of the images near the Urwahi gate was removed.

194. GAURI-SANKARA AND CHAUSATH-YOGINI TEMPLES, BHERAGHAT, DISTRICT JABALPUR.—The decayed lime-plaster on the inner portion of the temple was raked out and a fresh layer provided wherever needed. The cracks were properly filled in with toned mortar. The floor of the platform was also repaired.

195. VISHNU-VARAHA TEMPLE, KARANPUR, DISTRICT JABALPUR.—The bulged masonry of the platform was rebuilt.

196. SIVA TEMPLES, NARESWAR, DISTRICT MORENA.—An approach-road, properly demarcated by guard-stones, was provided for this group of temples situated on the banks of a tank on the top of a hill. The much-needed repairs to the dislodged *sikharas* will be undertaken shortly.

197. FORT, ASIRGARH, D1STRICT NIMAR.—Jungle-clearance over an extensive area and reconditioning of approach-roads were undertaken at this important hill-fort.

198. BIBI SAHIB'S MOSQUE, BURHANPUR, DISTRICT NIMAR.—The work of supporting the *minar* was further continued *(1956-57,* p. 61). At the same time, fresh carved veneer-stones were prepared for replacing the decayed ones. The work is in progress.

199. SHAH NAWAZ KHAN'S TOMB, BURHANPUR, DISTRICT NIMAR.—A fresh lime-concreted terrace was provided for the leaky roof of the verandah. Expanded-metal shutters were fixed to the openings to arrest bat-nuisance. The protected area around the monument was fenced.

200. SHAH SHUJA'S TOMB, BURHANPUR, DISTRICT NIMAR.—The pitted floor of the platform around the tomb was repaired by the laying of fresh concrete.

201. MAHADEVA TEMPLE, BHOJPUR, DISTRICT RAISEN.—The debris adjoining the temple-walls was removed. The heavy dislodged stones lying precariously on the extant top were properly arranged and a part of the open *sikhara* was covered by fresh stones, already hoisted last year *(1956-57,* p. 61). Further work is in progress.

202. FORT, ISLAMNAGAR, DISTRICT RAISEN.—The collapsed portions of the boundary-wall were rebuilt in coursed rubble-masonry to stop the entry of cattle. Expanded-metal and glass fixtures were provided to broken panels of windows and doors of the *baradari* and Shish-Bangla.

203. FORT, RAISEN.—This derelict fort, a stronghold of the Sultans of Malwa in the fifteenth century, was attended to by repairs to the flanking walls of the approach-road, eradication of thick veget tion from the high walls of the royal palaces and making of the roof of a part of the Jhinjri-Mahal watertight.

204. GROUP OF MONUMENTS, SANCHI, DISTRICT RAISEN.—After a thorough examination of the factors likely to affect the stability of Stupa 1, it was decided to grout its body-fabric with a view to consolidating the loose inner core and making it a solid watertight mass. To begin with, the cylindrical part of the Stupa below the middle balustrade was subjected to drilling operations in sections and a series of staggered holes were bored at four different levels to a varying axial depth of 3 to 5 ft. Through these holes the grout-mixture of ascertained proportions was driven into the core under pressure. The work is in progress.

The approach-road to Monastery. 51, located on the lower terrace west of Stupa 1, was paved with flagstones. Temple 17 was rendered watertight by the filling in of the joints in the roof-slabs. The tops of walls of Temple 18 and Monastery 38 were made watertight by the re-laying of the upper brick-courses in lime-concrete mixed with cement. *Morum* was spread over the pathways leading to the different monuments.

205. FORT, KHIMLASA, DISTRICT SAGAR.—Rank vegetation was removed from over an extensive surface of the fort. Cracks, voids and open joints in the fort-wall were filled in to avoid dislodgement.

206. HELIODORUS PILLAR, BESNAGAR, DISTRICT VIDISHA.—As a measure of improving the monument, the modern structures lying in the vicinity were partly removed and the area levelled (*1956-57,* p. 61).

207. ATHKHAMBA, GYARASPUR, DISTRICT VIDISHA.—The monument, comprising eight pillars of the *sabha-mandapa* and the door-frame of the shrine, was fenced to avoid trespass and misuse.

208. BHIMGAJA PILLAR, PATHARI, DISTRICT VIDISHA.—The dislodged and sagged stones of the platform around this monolithic Vaishnava pillar of the ninth century were re-set over a 4-in. thick layer of lime-concrete. The missing stones in the plinth were replaced.

209. ROCK-CUT CAVES, UDAIGTRI, DISTRICT VIDISHA.—The cracks in Caves 5 and were grouted to stop the percolation of rain-water inside the main shrine.

Rajasthan

210. ROCK-CUT CAVES, KOLVI, DISTRICT JHALAWAR.—The soft earth and pulverized portions of the rock overlying the caves were removed along with rank vegetation to stop the percolation of water.

MONUMENTS MAINTAINED BY STATES

ANDHRA PRADESH STATE

1. SHAMSHIR KHOTA, GOLCONDA, HYDERABAD.—Due to heavy rains, a portion of the walls of the building had fallen down and several cracks had arisen in the roof of the building, which had also a dump, causing hindrance to the flow of rain-water. The wall was reconstructed, cracks repaired, debris cleared and vegetation removed.

2. QUTB-SHAHI MONUMENTS, MACHLIKAMAN, DISTRICT HYDERABAD.—A wall constructed of Shahabad polished stones was repaired thoroughly.

3. NARASIMHASVAMI TEMPLE, ALAMPUR, DISTRICT MAHBUBNAGAR.—The leaky terrace was repaired by the scraping off of the old plaster and re-laying of lime-mortar plaster in two coats and provision of necessary slopes on all sides.

4. RASASIDDHA-MATH, ALAMPUR, DISTRICT MAHBUBNAGAR.—The terrace was concreted with brick-jelly in lime and made waterproof. The joints of the Shahabad

stone flooring were pointed with cement-mortar and necessary slopes to drain off rain-water were provided.

5. FORT, MEDAK.—The fortifications 1 1/2 miles in circuit, had been over-grown with wild jungle. All rank vegetation was removed from the wall, entrance-gate and bastions. A. portion of the fortification-wall, 62 ft. long and 14 ft. wide, damaged by rains and blocking up the entrance by its boulders, was reconstructed. Drains were provided to divert rain-water. The approach-paths to the fort were cleared of the thorny bushes and the buildings inside the fort were tidied up.

6. FORT, BALKONDA, DISTRICT NIZAMABAD.—This medium-sized fort had been covered with rank vegetation and the main entrances blocked by the falling of mud-walls; large cracks had been in evidence. The monument was preserved by the removal of debris and vegetation and filling in of cracks.

7. RAMASVAMI TEMPLE, DITCHPALLI, DISTRICT NIZAMABAD.—The landing stages, filled with earth, were levelled with lime-concrete on both the sides of the stairs; A 2-ft. high parapet-wall of rubble stone in lime-mortar was constructed on three sides of the courtyard, the front (eastern) wall being 62 ft. and the other two (northern and southern) 38 ft. long. Vegetation was removed from the platform and gates, and the platform was given a proper slope by the trimming of grass. Drains were dug. The cracks of the 'bastions were repaired and lime-pointed at some places.

8. MISCELLANEOUS.—Protection notice-boards were put up at eight monuments.

BOMBAY STATE

9. MONUMENTS, DISTRICT AURANGABAD.—Repairs were done to : Saivite temple, Anwa; city-wall, gates, etc., Lai Masjid and Sunheri Mahal, Aurangabad; and five unidentified Bahmani tombs, Delhi Darwaza, Nizam-Shahi Darwaza, Old 'Idgah and Rasai-Mata temple, Daulatabad.

10. MONUMENTS, BOMBAY.—Vegetation was removed from the crevices of the statues of Mount Stuart Elphinstone and Wellesley, Elphinstone Circle Garden, Bombay (work done by the Municipal staff).

11. SONKANSARI TEMPLES, GHUMLI, DISTRICT HALAR.—Vegetation was removed and scattered sculptures were arranged.

12. MONUMENTS, DISTRICT SORATH.—The following were attended to : temple, Madhopur; Pancheswar caves, Junagadh; gates and walls, Juma-Masjid and Navaghan well in Uparkot, Junagadh; caves, Mandor; Vaneswar temple, Patan; Kasturba House and Sartanji Chora, Porbandar; caves, Prabhas Patan; and temple, Visavada.

KERALA STATE

13. MONUMENTS, DISTRICT TRICHUR.-The following received attention, mostly by way of clearance of vegetation and minor repairs: Portuguese fort and its surroundings, Chennamangalam; the palace-site of the *raja* of Villaravattath (Kottayil-kovilakam), Chennamangalam; the Cheramanparambu, Kottapuram; dolmens and the site round the Velarkal temple, Porkalam; the Kizhtali temple, Thfiruvanchipuram;

eastern and western gateways of the old palace, Trichur; the western gate of the Vedakkechira palace, where a supporting wall was constructed; *naga-raja* and *naga-yakaha* in Palace Thoppu; and monuments at the sites of the cremations of Saktan Thanpuram and the Zamorin of Kozhikode.

MADRAS STATE

14. PADMANABHAPURAM PALACE, DISTRICT KANYAKUMARI—A few minor repairs to the roof, including the preservation of the woodwork, were carried out.

RAJASTHAN STATE

15. AKBAR'S FORT, AJMER.—Apart from internal annual repairs, special measures were taken for the removal of small trees with their roots from the outer side of the quadrangular wall. For the convenience of the visitors, the main block was provided with flood-lighting arrangements without damage to the monument.

UTTAR PRADESH STATE

The following monuments received attention.

16. TOMB OF TAKHAT PAHLWAN, AGRA.

17. MONUMENTS, DISTRICT JHANSI.—Temple of Lakshmidevi of Rani Lakshmi Bai and temple of Ramachandraji, Samthar.

18. RAS KHAN'S CHHATRI, GOKUL, DISTRICT MATHURA.

19. TEMPLE OF NAROTHAM KAIR, BARI, DISTRICT SITAPUR.

20. TOMB OF MALIK MUHAMMAD JAISI, AMETHI, DISTRICT SULTANPUR.

21. MONUMENTS, DISTRICT TEHRI-GARHWAL.—Jamadagni Rishi and Saileswar Mahadeva temples.

22. TOMB OF LATIF SHAH, DISTRICT VARANASI.

IX. ARCHAEOLOGICAL CHEMISTRY

TREATMENT OF MONUMENTS AND PAINTINGS[1]

ANDHRA PRADESH

1. VIRABHADRASVAMI TEMPLE, LEPAKSHI, DISTRICT ANANTAPUR.—Half the area of the outer walls of the temple, nearly an equal area of the opposite wall and about one-fourth of the area of the ceiling, all covered with soot, oil and dirty accretions, which had become hardened and cemented to the painted surface, were cleaned and the paintings brought to light.

BOMBAY

2. ROCK-CUT CAVES, AJANTA, DISTRICT AURANGABAD.—The work of removing shellac-varnish from the painted surfaces in Caves 16 and 17 was continued (pls. CXVI-CXVIII), the method being the same as followed last year *(1956-57,* p. 66). All the untreated squares in Cave 16 were cleaned, leaving only a few here and there for comparison and watching of the effect of the treatment; thus, nearly three-fifths of the painted area have been cleaned. In Cave 17 the treatment of about one-third of the area has been completed.

3. ROCK-CUT CAVES, ELLORA, DISTRICT AURANGABAD.—The group of paintings in the Ganesa-*lena* was given a preservative coating and the edges of loose stuccoes were filleted with suitably-tinted plaster of Paris. In Cave 32, last year's treatment *(1956-57,* p. 66) had brought out the details of the linear draughtsmanship of the artist but not the colours. This year, it was possible, through the use of various mixtures of organic solvents, to uncover a series of brightly-coloured paintings of a new school (pl. XCIX). Side by side, the work of filleting the loose stucco-edges was continued.

4. TAMBEKARWADA, BARODA.—The work of cleaning and preservation of the paintings, which had been in progress for about three years *(1954-55,* p. 48; *1955-56,* p. 54; *1956-57,* p. 65), was successfully completed during the year.

5. MAHAKALI TEMPLE, CHANDA.—The remnants of the old paintings on the temple-walls, exposed here and there, were freed from the overlying coat of lime and subjected to treatment and preservation, with the result that paintings over a considerable area were brought to light (pl. CXX). The work is in progress. The treatment of the paintings on the front arch of the temple was completed.

KERALA

6. SIVA TEMPLES, CHEMMANTHATTA, PALLIMANNA AND PERUVANAM, DISTRICT TRICHUR.—The painted surfaces in the three temples were cleaned and the paintings preserved. In all cases, the work was completed.

[1] Nos. 4, 5, 9-13, 15 and 18-26 were attended to by the Archaeological Chemist in India and the others by the Assistant Archaeological Chemist.

7. VADAKKUNATHAN TEMPLE, TRICHUR —The paintings on the outer wall of the Sankara-Narayana shrine and on the walls of the eastern and western *chittambalam* and of the Vrishabha-vahana shrine were cleaned and preserved. In the *nandi-mandapa* nearly three-fourths of the painted area were completed.

8. RAMA TEMPLE, TRIPRAYAR, DISTRICT TRICHUR.—The paintings on the outer walls were completely cleaned and preserved.

MADHYA PRADESH

9. KANDARIA-MAHADEVA TEMPLE, KHAJURAHO, DISTRICT CHHATARPUR.—The work of removing algal growth, other vegetation, injurious soluble salts and other accretions {*1956-57,* p. 64) was continued during the year and is still in progress. The fungicidal and preservative treatment will be taken up after this work is complete.

10. ROCK-CUT CAVES, BAGH, DISTRICT DHAR.—The treatment of wall-paintings in the caves continued throughout the year *(1956-57,* p. 65). In Cave 3, tarry accretions, grease and smoke, which had obscured the paintings, were thoroughly removed by a judicious use of detergents, organic solvents and other reagents and the paintings completely treated and preserved. A considerable painted area in Caves 2 and 4 received similar treatment..

11. ROCK-SHELTERS, PACHMARHI, DISTRICT HOSHANGABAD.—The Bania Beri and Dorothy Deep rock-shelters were treated, with the result that the flaking of the pigments has been arrested.

12. MONUMENTS, SANCHI, DISTRICT RAISER—A number of pillars and capitals lying near Stupa 1 were subjected to an elaborate treatment and preservation. The accretion of moss and lichen, the result of centuries of exposure, was removed and the clean stonework given a fungicidal treatment. As a result, the pieces have regained their original appearance.

13. ROCK-CUT CAVES, UDAIGIRI, DISTRICT VIDISHA.—The sculptures and inscription:; were successfully treated and preserved.

MADRAS

14. CAVE-TEMPLE, TIRUMALAIPURAM, DISTRICT TIRUNELVELL—The broken edges of the surviving patches of plaster were secured by filleting.

MYSORE

15. ASAR MAHAL, BIJAPUR, AND WATER-PAVILION, KUMATGI, DISTRICT BIJAPUR.—The treatment and preservation of the paintings on these monuments, which had been brought under a scheme of special repairs about a couple of years ago *(1955-56,* p. 54; *1956-57,* p. 65), were completed this year with striking results. The loss of the pigments through flaking has been completely stopped.

16. GOMMATESVARA STATUE, SRAVANABELGOLA, DISTRICT HASSAN.—As a result of the last *mastakabhisheka-ceremony,* the statue had been covered with organic

accretions, oils and stains. Since it is exposed to sun and rains, there had also been a growth of moss and lichen on the surface. All the accretions were more or less removed on the back and sides of the statue and a few other parts were cleaned. The discolourations at other places of the statue are being attended to.

17. DARIA-DAULAT-BAGH, SRIRANGAPATNA, DISTRICT MANDYA.—The paintings on the outer eastern and western walls had been covered with accretions of dust, dirt, soot, stains, cobwebs, insect-nests and cocoons. The two walls were divided into squares, and each alternate square was cleaned. After this initial work, the entire wall-surfaces were treated, leaving only a few squares untouched for purposes of comparison.

ORISSA

18. LINGARAJA TEMPLE, BHUBANESWAR, DISTRICT PURL—Intensive work was continued *(1956-57,* p. 64) on the temple, as a result of which nearly three-fourths of the surface-area were cleaned with very satisfactory results.

19. MUKTESVARA TEMPLE, BHUBANESWAR, DISTRICT PURL—The sculptured walls were subjected to general cleaning and preservation. Attention was also directed to the cleaning of the mortar-stains on the gateway of the *jagamohana.*

20. ROCK-CUT CAVES, KHANDAGIRI, DISTRICT PURL—Some sculptures, heavily coated with oily and greasy accretions, were cleaned.

UTTAR PRADESH

21. 'ITIMADU'D-DAULAH'S TOMB, AGRA.—As a result of continued treatment *(1955-56,* p. 54; *1956-57,* p. 65), most of the paintings were freed from accretions, grease and smoke and were preserved (pl. CXXI A). The remaining part of the work will be finished shortly.

22. GROUP OF MONUMENTS, FATEHPUR SIKRI, DISTRICT AGRA.—The paintings in the different monuments were subjected to continued treatment *(1955-56,* p. 54; *1956-57,* p. 65), with the result that many obscure paintings were brought to light and their condition considerably improved (pl. CXXIII B). The work will be finished shortly.

23. AKBAR'S TOMB, SIKANDARA, DISTRICT AGRA.—Most of the painted area in the Sunheri-Mahal continued to be treated and preserved *(1956-57,* p. 65) with highly satisfactory results (pls. CXXII A and CXXIII A). The remaining part is under treatment.

24. MONUMENTS, KHUSRO-BAGH, ALLAHABAD.—The paintings continued to receive attention *(1955-56,* p. 54; *1956-57,* p. 65), so that three-fourths of the work were completed in the tomb of Khusro (pl. CXXI B) and Sultanu'-n-Nisa Begam. The remaining part will be completed shortly.

25. EXCAVATED REMAINS NEAR KALSI, DISTRICT DEHRA DUN.—The work of the treatment and preservation of the bricks, both inscribed and uninscribed, which had been taken up earlier *(1955-56,* p. 53; *1956-57,* p. 64), was completed, so that their disintegration has been arrested.

ARCHAEOLOGICAL CHEMISTRY

26. FORT, TALEBHAT, DISTRICT JHANSI.—The work on the Narasimha temple, continued from previous years *(1955-56,* p. 54; *1956-57;* p. 65) was completed, so that the paintings are now in a satisfactory condition (pl. CXXII B)

TREATMENT OF EXCAVATED OBJECTS AND MUSEUM-EXHIBITS

The ARCHAEOLOGICAL CHEMIST IN INDIA received for treatment six hundred and fiftytwo objects of diverse nature, such as copper, bronze and iron objects and silver and lead coins, mostly from Nagda, Bahal, Nagari and Lothal (Saragwala), of which more than half were treated and the rest are receiving attention. In addition, one hundred and sixtysix silver coins, two copper containers and one earthen pot were also treated; A large number of objects, consisting of a wide variety of material, such as pottery, terracottas, plaster, alloys, glass, etc., were studied.

The ASSISTANT ARCHAEOLOGICAL CHEMIST, MUSEUMS BRANCH, treated and preserved upwards of twelve hundred objects, variously belonging to the Central Asian Antiquities Museum, other Departmental museums and also the National Museum.

The electrolytic treatment of metal objects was brought into regular service, and it is planned to increase the capacity of this method by the addition of a few locally-constructed apparatuses. Ways to overcome the shortcomings of this method, such as the deposition on the objects so treated of a very thin incoherent film of some black residual matter, present in the object or generated in the system, is under investigation. About nine hundred objects recovered from excavations received attention. Pieces of a small string and highly-charred disintegrated cloth from Ujjain, as also the imprints of baskets on clay (pl. XXXVIII B) deserve particular mention. Over eight hundred paper and palm-leaf manuscripts of the Hampi Museum were treated for fungal growth and colonies of mould. Thirty sculptures of the same Museum, disfigured by a complex type of accretion, as much as 1/2-in. thick on a few pieces, found to consist of compacted lichen, oil, etc., were cleaned. Sixtysix sculptures of the Sarnath and Bodh-Gaya Museums were cleaned of vegetational growth and lime and other incrus-tations. Sculptures affected by efflorescence and subjected to exfoliation were freed of deleterious salts. The work of the elimination of black paint and coal-tar streaks from the sculptures in the Amaravati Museum was continued *(1956-57,* p. 67) and almost completed. The large bronze collection of the Nalanda Museum was re-examined and the pieces requiring treatment were separated.

The painted surfaces over a few small areas of the previously-treated Central Asian wall-paintings, showing a weakening of the bond with the under layers, were strengthened. A painted stucco head from Central Asia was fully examined with a view to finding out the technique of the painting. Valuable information having a bearing on the ancient Central Asian art of wall-painting as ' compared with some techniques of medieval Europe was obtained through the study.

The problem of the removal of resistant stains from antique painted silk and cotton banners without affecting the colours was given intense attention (pl. CXXIV). The surface-active properties of a few chemical agents were found to be of better utility than processes involving only the dissolving action of solvents.

REVIEW RESEARCH

1. CERAMICS.—The Archaeological Chemist continued his studies on ancient ceramics and subjected several thin sections of pottery-specimens to microscopic examination.

The Assistant Archaeological Chemist undertook and completed a scientific study of the pottery from Maski, District Raichur *(1953-54,* p. 8).

2. GEOCHRONOLOGY.—As a result of a detailed analysis and microscopic examination by the Archaeological Chemist of the soil-samples collected from the excavated site at Birbhanpur, District Burdwan *(1956-57,* p. 67), with a view to the determination of the conditions under which the deposits had been laid, it was possible to reconstruct the climatic oscillations the site had undergone before and after the microlithic phase. Heavy mechanical analysis was also taken up, but the work will take some time to complete. The work on the soil-samples from Rupar, District Arhbala *(ibid.),* was completed and the report thereon is under preparation.

3. TREATMENT OF PAINTINGS.—The investigation on the chemical conservation of ancient wall-paintings *(1956-57,* p. 68) was intensively pursued, and, as a result of the collected data, it became possible to effect considerable improvements in the methods of treatment and preservation. By the use of mixed solvents evolved as a result of laboratory-research, the technique of removing tarry, greasy, smoky and resinous accretions from painted surfaces was considerably improved. Investigation on the further improvement of the film-softeners evolved last year *(ibid.)* to deal with dry brittle pigments-layers was continued.

The Assistant Archaeological Chemist installed self-recording thermographs and hydrographs at Ajanta and Tanjavur, as an experimental measure, to collect data on the variations of temperature and humidity, which affect wall-paintings under certain circumstances.

4. TREATMENT OF MONUMENTS.—The Archaeological Chemist conducted laboratory-tests of waterproofing materials for dealing with the problem of dampness and action of sea-salts on stonework. The question of the eradication of algal growth from exposed monuments was also studied and experiments were conducted with a number of materials.

The Assistant Archaeological Chemist prepared microscopic sections of the Ajanta and Ellora rocks for the study of rock-disintegration.

X. ARCHAEOLOGICAL GARDENS

BOMBAY

1. BIBI-KA-MAQBARA, AURANGABAD.—In order to re-lay the gardens a pipe line was laid for a considerable length for the supply of water. The existing water-channels in between the plots were made watertight. The operation is in progress.

2. SHANWARWADA, POONA.—The work initiated last year *(1956-57,* p. 76) was extended over a wider area this year. Most of the area was laid with lawns and plants, with a pleasing effect. Concrete benches are being provided along the boundary-wall for the use of visitors. With the bringing in of the remaining plots under operation in 1958-59, the whole compound will have been brought under the scheme of gardening.

DELHI

3. QUTB, DELHI.—An extensive car-park, with diversion-roads and avenues of trees, was planned and partly laid. Suitable trees were planted along the roads for shade.

4. HUMAYUN'S TOMB, NEW DELHI.—The plots of land in front of 'Isa Khan's tomb, which had been full of debris, were cleared and converted into lawns. The nursery was enriched by the introduction of new varieties of plants for multiplication. The *chick-house* nursery was extended.

An outstanding feature was the creation of a miniature landscape-garden in a 4-acre wild land on the north-western corner of the tomb. The area was dressed up after the removal of all jungle-growth, the hardy shrubs and self-sown plants being, however, retained at odd places. The natural contours of the land were maintained and only the flat plots were grassed. A serpentine road and narrow foot-paths, pitched with rubble, were laid. The area presents a pleasing contrast to the adjacent formal Mughul garden round the tomb.

5. MISCELLANEOUS.—All the gardens were maintained in proper trim. At most monuments, deep-rooted plants growing in close proximity to the ancient walls were pulled out and others were kept detached from the walls so as to allow the free movement of air between the walls and the plants and to obviate all possible contacts of transpiration-moisture with the walls. Old weedy lawns were regrassed at Kotla Firuz Shah, Qutb and Red Fort.

UTTAR PRADESH

6. FORT, AGRA.—Some of the shrubberies at the Akbari-Mahal were replanted according to colour- and height-schemes. The main drive opposite the Diwan-i-'Am

area was slightly narrowed down and provided with edging stones. The Moti-Masjid area was brightened up by the training of creepers into standards and pruning of shrubs and trees.

7. KHAN-I-'ALAM NURSERY, AGRA.—The propagational activities in the nursery were kept in full swing. Many beds were laid out in a systematic order to increase the space for propagation. New varieties of plants and seeds were imported from different parts of India and abroad. A new conservatory was built for delicate plants and the glass-house was partly repaired. Worn-out pips-lines ware repaced.

8. TAJ MAHAL, AGRA.—The garden facing the mausoleum was improved by the removal of the central beds in the front lawns and of dead plants and judicious pruning of the trees to expose the natural vistas and the focal points of the monuments. Many shrubberies were overhauled keeping in view colours, heights, etc. Four plots were returfed. Care was taken to keep the lawns weed-free by the use of cultural, mechanical and chemical means.

9. MISCELLANEOUS.—The other gardens at Agra, *viz.* Chini-ka-Rauza, 'Itimadu'd-Daulah, Ram-bagh, Roman Catholic Cemetery and Sikandara, were properly maintained and improved.

The gardens attached to the Khusro-bagh, Allahabad, and Residency Buildings, Lucknow, were maintained through the respective Superintendents of Gardens of the State Government.

XI. PUBLICATIONS

DEPARTMENTAL PUBLICATIONS

1. ANCIENT INDIA.—Number 13 (1957) of the journal was published. Number 14 (1958) is in the press and will be available by October 1958.

2. ANNUAL REPORT ON INDIAN EPIGRAPHY.—The Reports for 1949-50 and 1950-51 were published and those for 1951-52, 1952-53 and 1953-54 were passed for printing. The Reports for 1954-55, 1955-56 and 1956-57 are going through the press.

3. CORPUS INSCRIPnONUM INDICARUM.—Part ii of volume II, *Bharhut Inscriptions,* edited by H. Lueders and revised by E. Waldschmidt, is in the proof-stage. Volume VI, *Inscriptions of the Vakatakas,* edited by V. V. Mirashi, is being made ready for the press.

4. EPIGRAPHIAINDICA.—Parts viii both of volumes XXVIII (October 1950) and XXIX <October 1952), parts iv (October 1953), v (January 1954), vi (April 1954) and vii (July 1954) of volume XXX and parts i (January 1955), ii (April 1955), iii (July 1955) and iv (October 1955) of volume XXXI were published. Part viii of volume XXX (October 1954) and parts v (January 1956), vi (April 1956) and vii (July 1956) of vo lume XXXI were passed for printing.

Part viii of volume XXXI (October 1956) and parts i (January 1957), ii (April 1957), iii (July 1957), iv (October 1957) and v (January 1958) of volume XXXII are in the proof-stage and parts vi (April 1958) and vii (July 1958) of volume XXXII and parts i (January 1959) and ii (April 1959) are with the press.

5. EPIGRAPHIA INDICA (ARABIC AND PERSIAN INSCRIPTIONS).—The number for 1955-56 is in the final stage of printing.

6. GUIDE-BOOKS.—The following were reprinted: *Khajuraho,* by B. L. Dhama and S. C. Chandra, and *Sarnath,* by V. S. Agrawala. The reprinting of *Ajanta,* by Debala Mitra, and *Rajgir,* by M. H. Kuraishi and A. Ghosh, is in progress. *Sanchi,* by Debala Mitra, was published and *Bhubaneswar,* by the same author, is being printed. The Hindi versions of *Sarnath, Sravasti, Rajgir, Khajuraho* and *Kusinagara* are in the proof-stage.

7. INDIAN ARCHAEOLOGY—A REVIEW.—The number for 1956-57 was published.

8. MEMOIRS OF THE ARCHAEOLOGICAL SURVEY OF INDIA.—Number 74, *Kausambi,* by G.R. Sharma, is going through the press.

'9. PICTURE-POSTCARDS.—The sets of Ajanta (monochrome and coloured), Ellora, Nalanda and Sanchi were reprinted. New sets of Aihole, Bhubaneswar, Khajuraho, Badami, Pattadakal and Mandu were printed, and the sets of Mahabalipuram, Delhi (Sets A, B and C), Sarnath, Chitorgarh, Elephanta, Agra, Bijapur and Kanheri are being reprinted. The following new sets are also being printed: Halebid, Somanathapur and Belur.

10. TEMPLE-ARCHITECTURE SERIES.--*Pallava Cave-temples,* by K. R. Srinivasan, is ready for the press, while *Khajuraho,* by Krishna Deva, is being made ready.

11. SOUTH INDIAN INSCRIPTIONS.—Volumes XV, *Bombay-Karnatak Inscriptions,* part ii, XVI, *Telugu Inscriptions of the Kings of Vijayanagara,* XVII, *Inscriptions collected during 1903-1904,* and XVIII, *Bombay-Karnatak Inscriptions,* part iii, were sent to the Government Press, Madras.

OTHER PUBLICATIONS

1. ANTIQUITIES AT NEVASA.—This work, by H. D. Sankalia and M. S. Mate, being published by the Government of Bombay, is in the press.

2. BULLETIN OF THE MUSEUM AND PJCTURE-GALLERY, BARODA.—Volume 12 of the Bulletin was published.

3. EPIGRAPHIA CARNATIKA.—The *Tumkur Supplement,* being published by the Government of Mysore, has been printed. The printing of the transliteration of volume XVII is nearing completion.

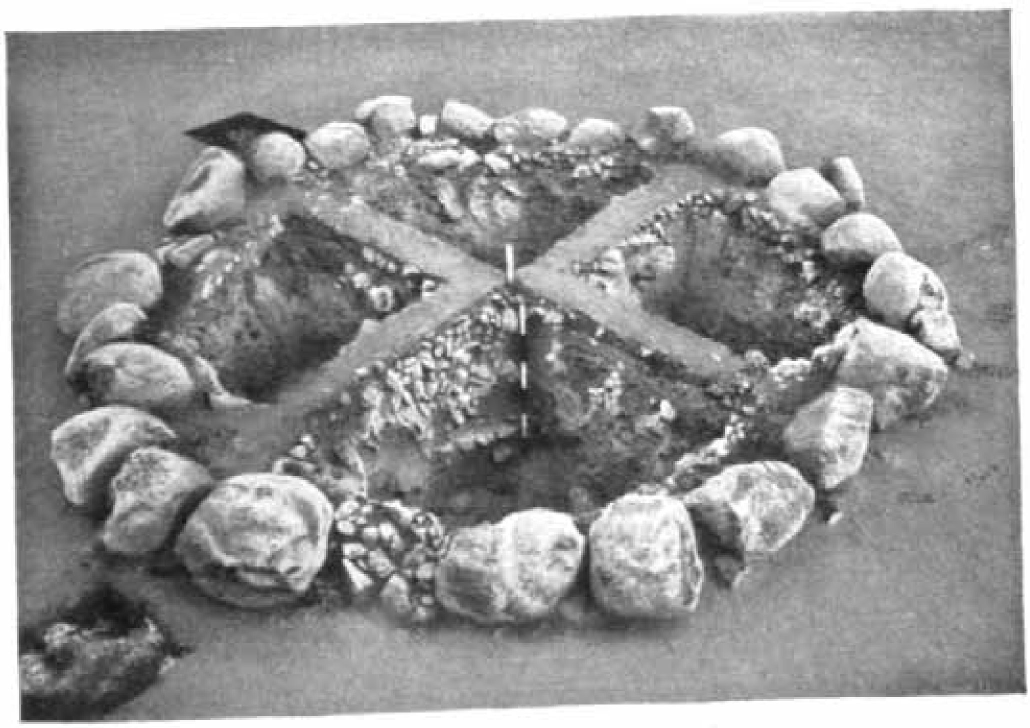
4. GUIDE-BOOKS.—The Hindi versions of the *Guides to Srirangapatna and Relur* are passing through the press and will be published by the Government of Mysore.

The Prince of Wales Museum, Bombay, published *A Guide to the Antiquities of the Historic Period.*

5. MISCELLANEOUS.—The Government of Bombay is publishing the following: *Akota Bronzes,* by U. P. Shah; *Excavations at Lakhabaval, Amara and Somnath; Interim Report on Further Excavations at Prabhas Patan; Origin and Evolution of Gujarat Style of Architecture,* by P. P. Pandya and M. A. Dhanky; *Architectural Activities at Prabhas Patan,* by P. P. Pandya, M.A. Dhanky and H. P. Shastri; and *Embroidery and Bead Work of Kutch and Saurashtra,* by J. M. Nanavati, M. A. Dhankv and M. P. Vora.

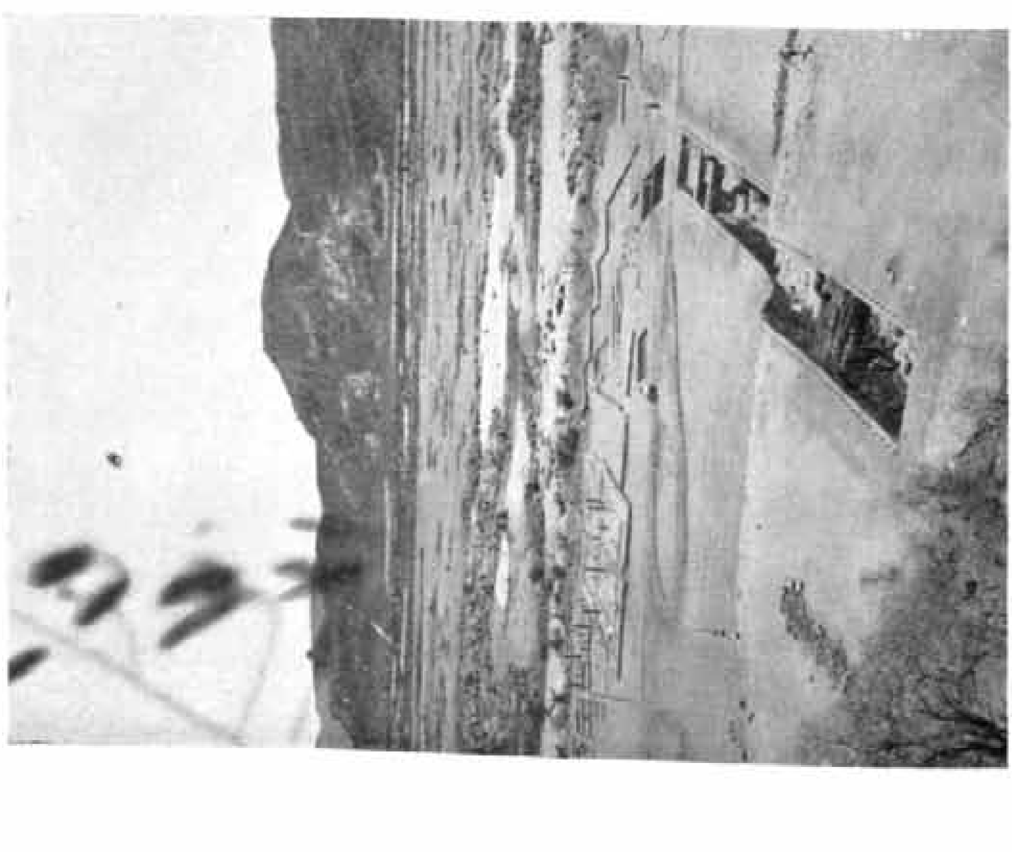


A

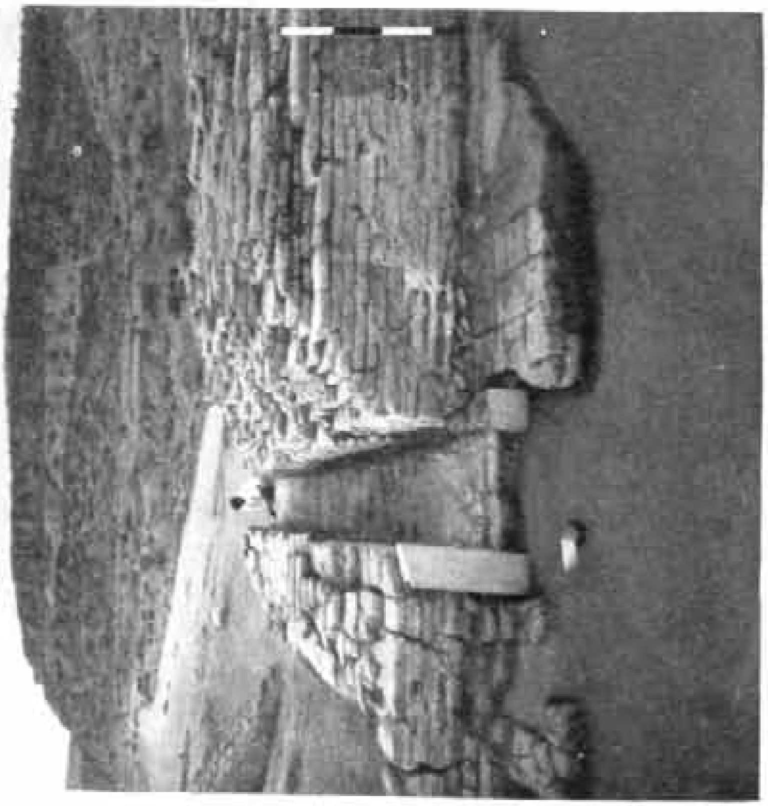


B

Nagarjunakonda : A, *neolithic burials during excavation (scale of inches)*; B, *Megalith 2 during excavation (scale of feet)*. *See page 5*

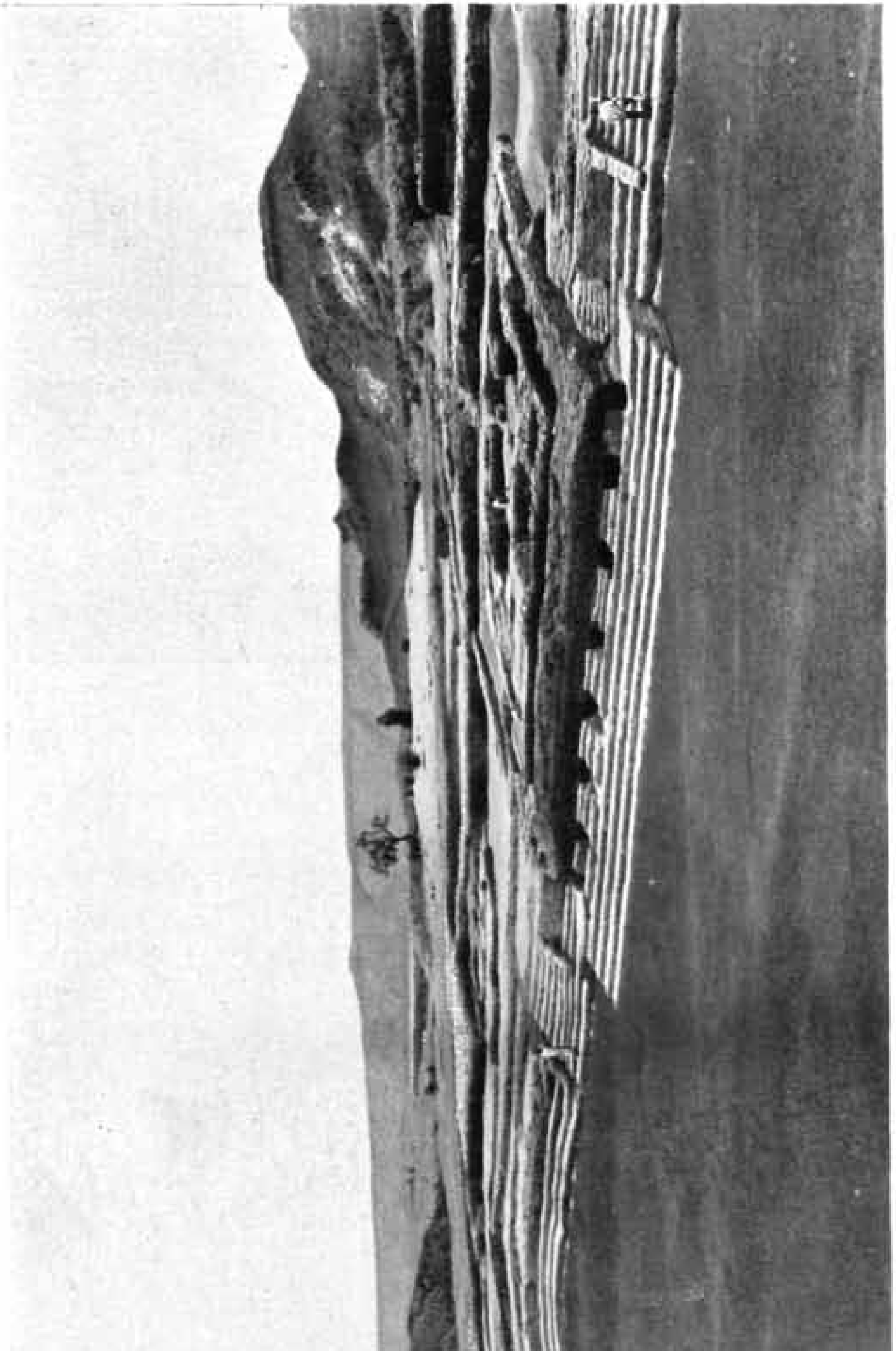


A

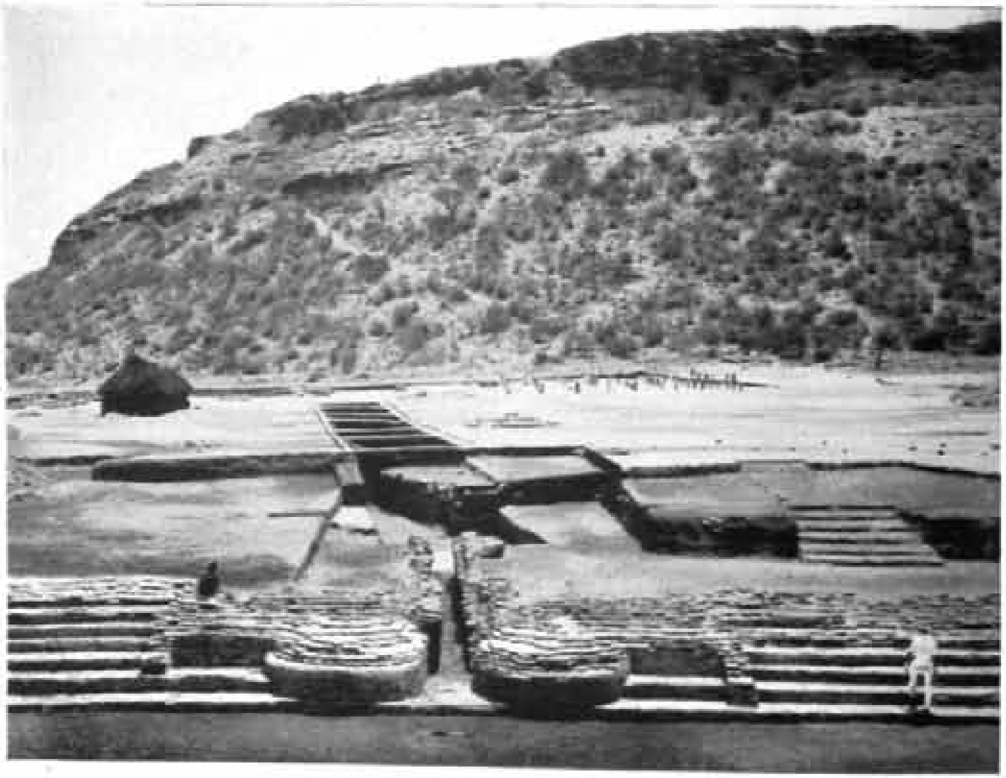


B

Nagarjunakonda: A, *trench across western defences of citadel, Karttikeya temple and river Krishna in middle ground;* B, *postern gate in northern wall of citadel (scale of feet).* *See page 5*



Nagarjunakonda : western wall of stadium, with central pavilion. *See page 6*



A



B

Nagarjunakonda : A, *part of northern wall of stadium with outlet-drain, Pushpabhadrasvami temple and Nagarjuna hill in background*; B, *four-winged dormitory*. *See page 8*



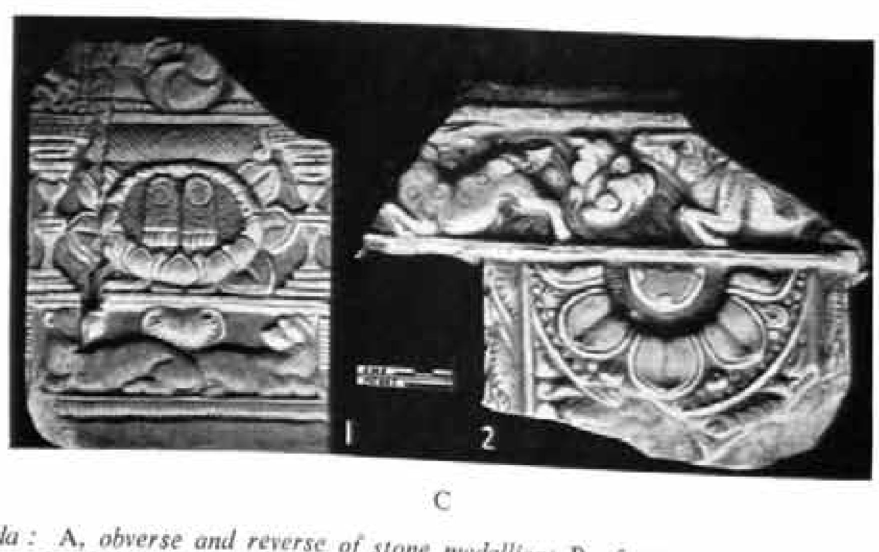
Nagarjunakonda : coins of Chamtamula, Viraparushadatta, Ehuvala Chamtamula and others. *See page 9*



A



B



C

Nagarjunakonda : A, *obverse and reverse of stone medallion;* B, *fragment of stone frieze with mithuna and yaksha;* C, *Buddha-pada on throne and fragmentary frieze.* *See page 9*



A



B



C

Nagarjunakonda : A, *stone yaksha (scale of inches)*; B, *lower part of inscribed seated stone figure*; C, *stone mithuna*. *See page 9*



A



B

Vaisali : A, *wall on northern slope of Kharauna tank (scale of feet)*; B, *stupa with five Periods, indicated as I-V, with concrete floor in background (scale of foot-and-inches)*. *See page 10*



A



B

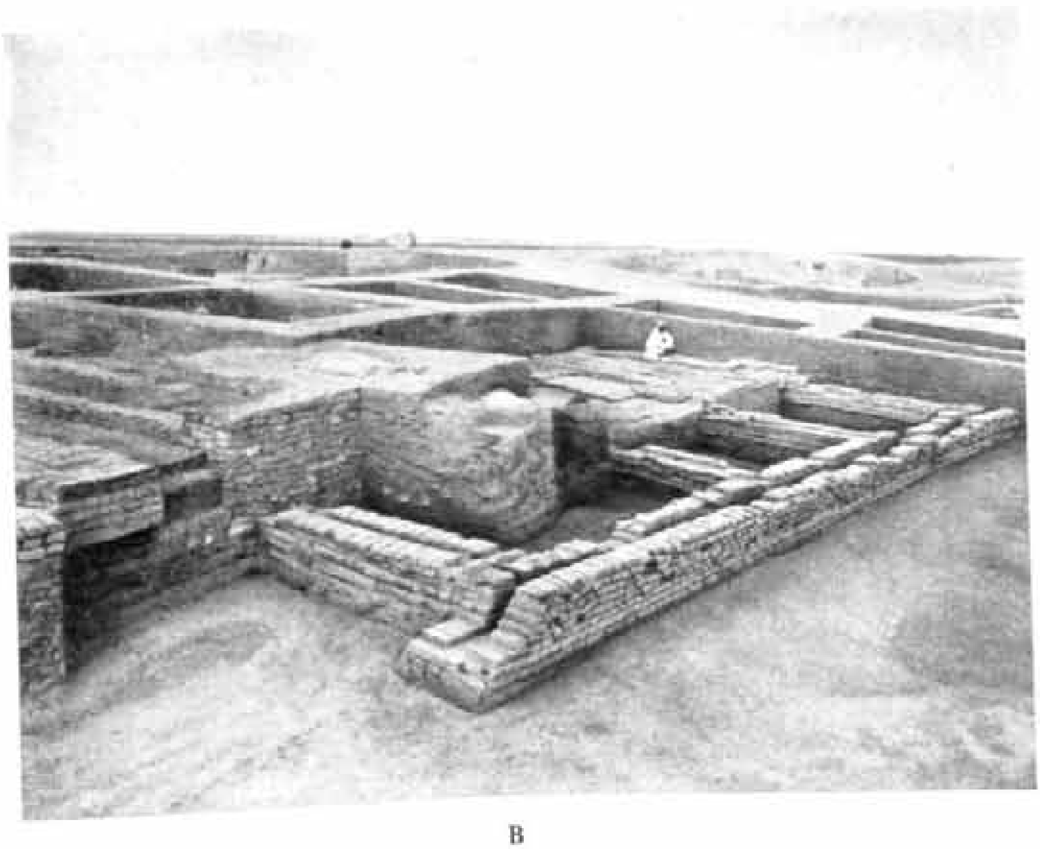
Vaisali : A, *section across stupa, with relic-casket in situ (scales of feet and half-foot-and-inches);* B, *steatite relic-casket* (½). See page 11



Lothal : well and drains. *See page 12*

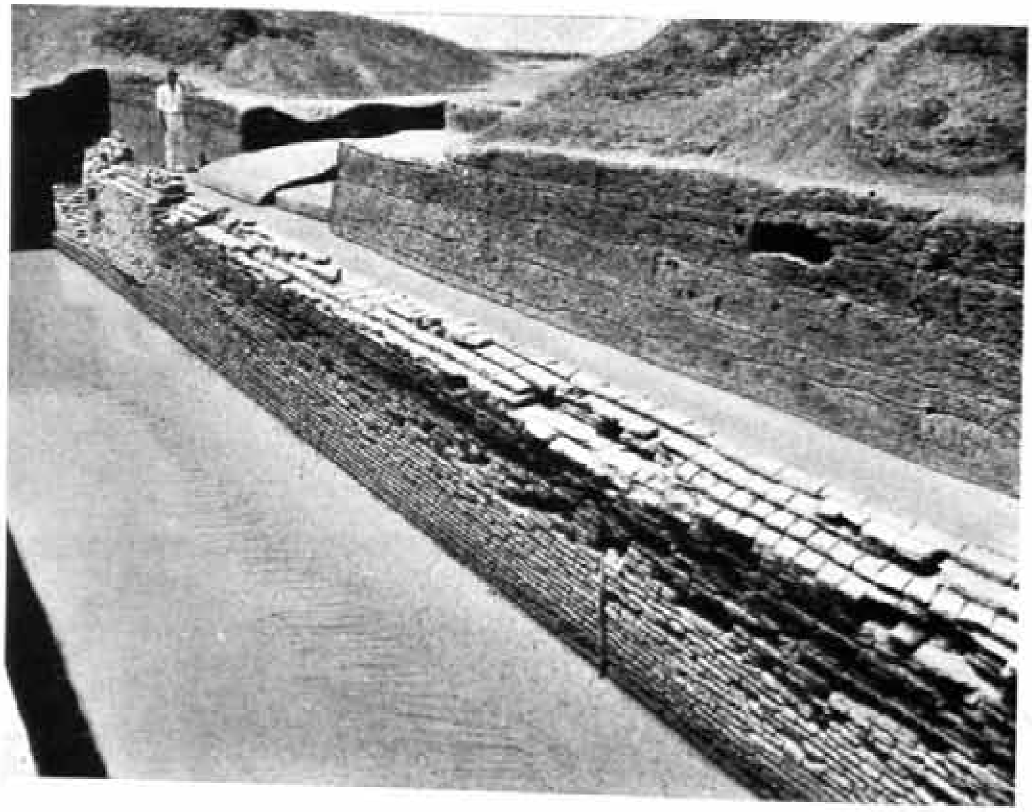


A

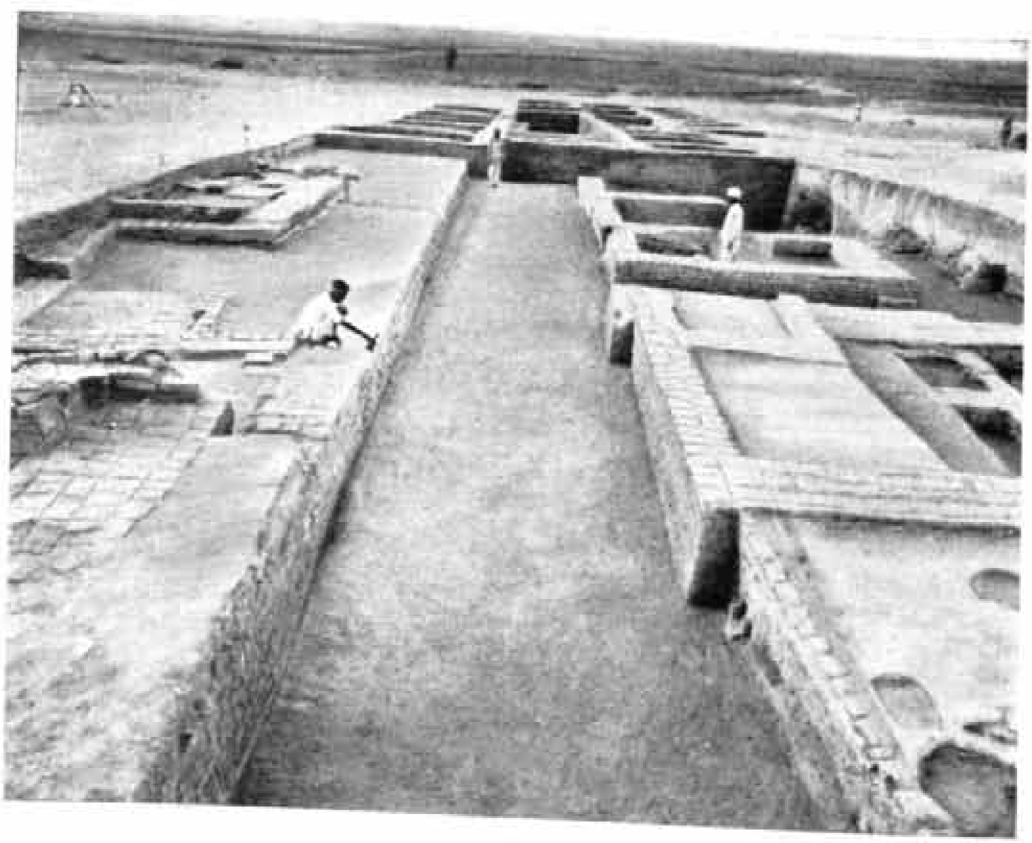


B

Lothal : general view of houses and drains. *See page 12*

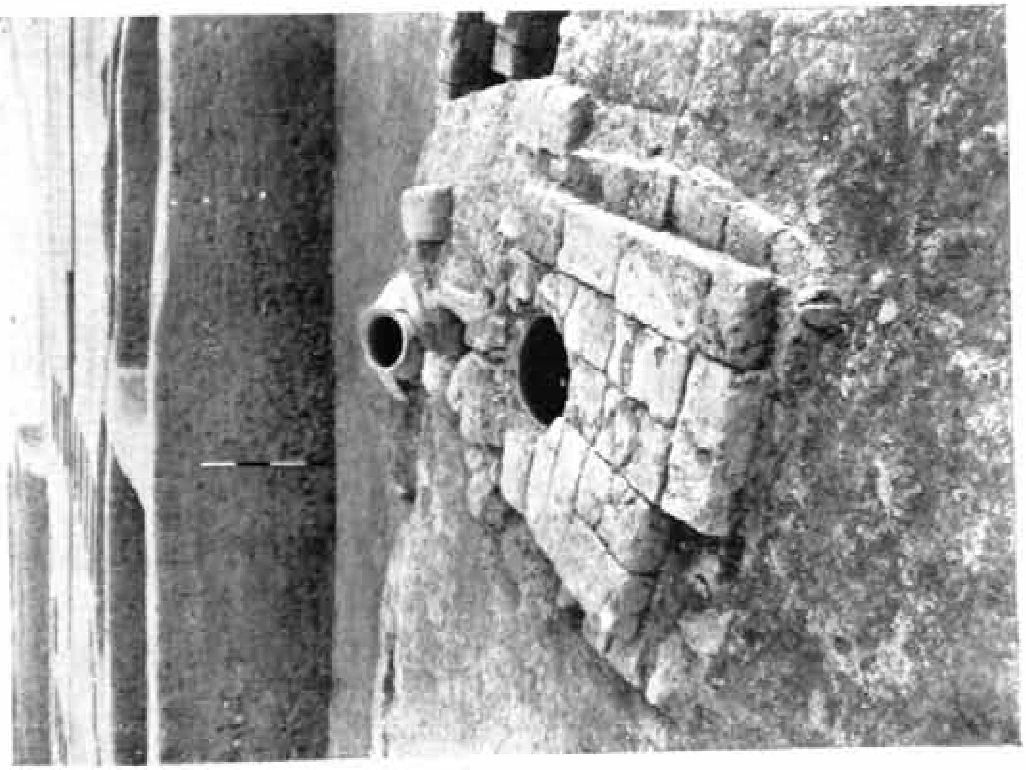


A

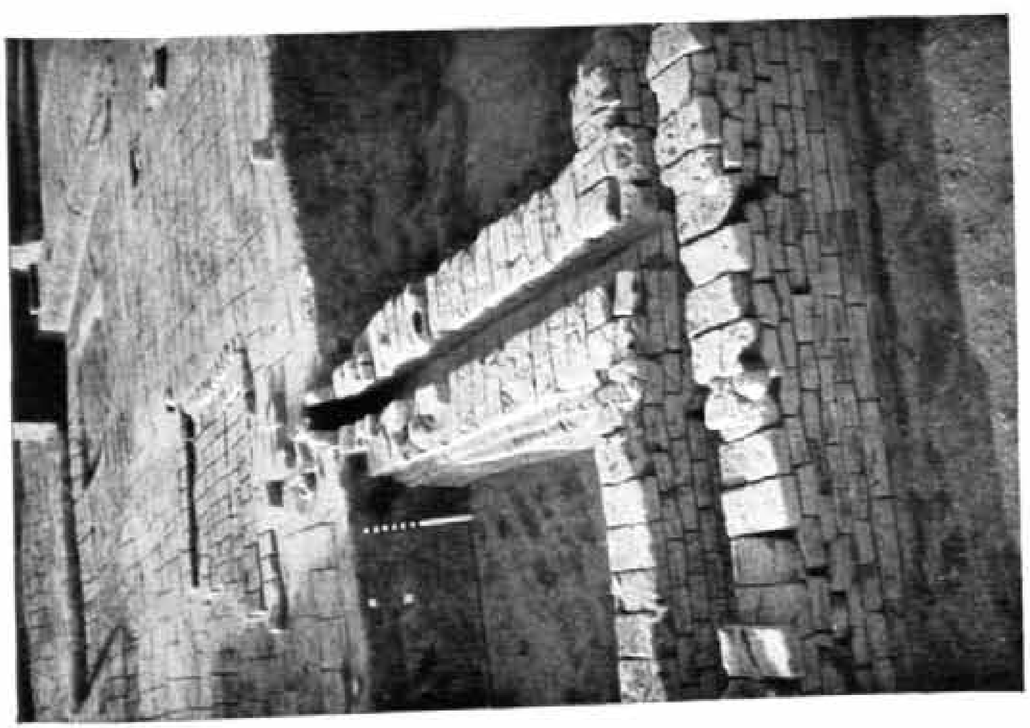


B

Lothal : A, brick revetment; B, street flanked by houses. See page 12



B

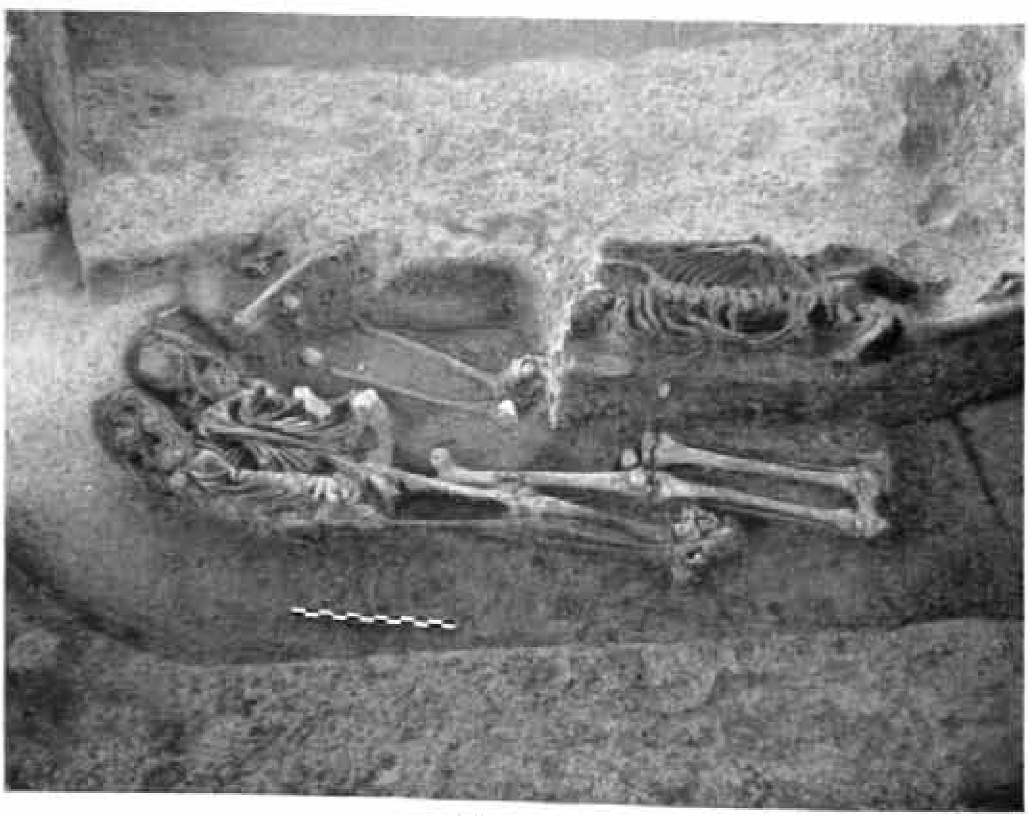


A

Lothal: A, bath platform with drain (scale of foot-and-inches); B, privy with soakage-jar (scale of feet). See page 12



A

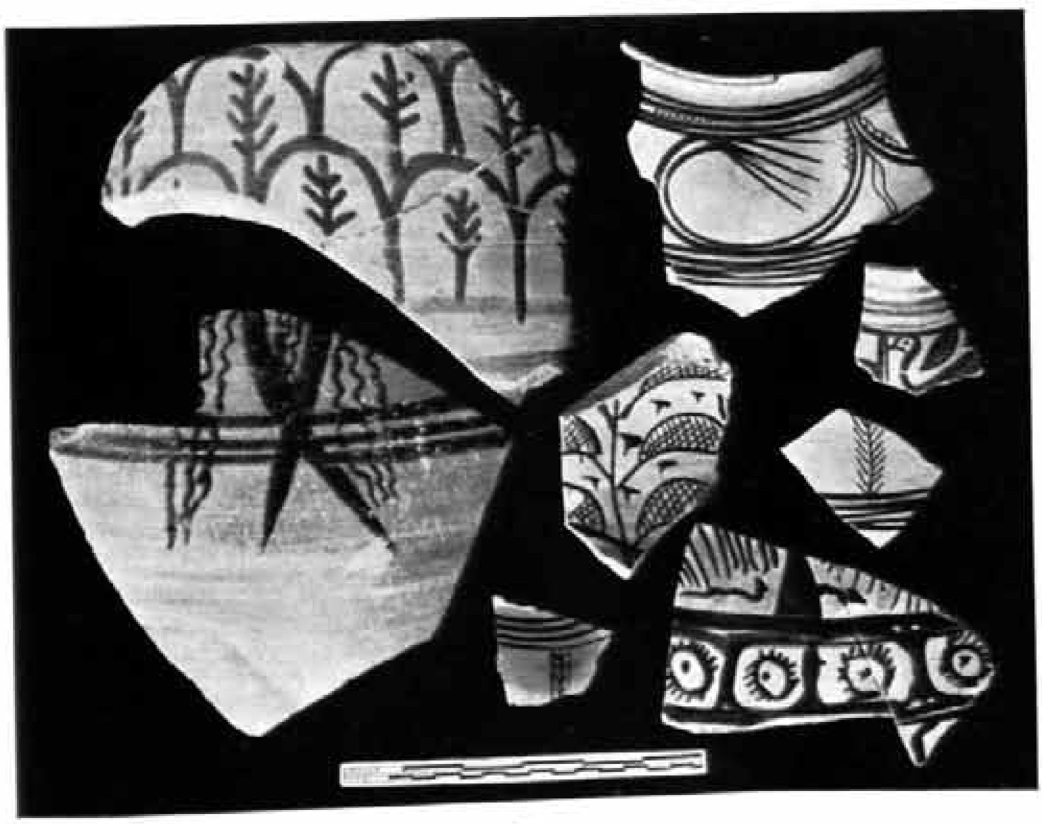


B

Lothal : A, *furnace associated with bead-manufacture (scale of feet)*. B, *human skeletons in cemetery (scale of inches)*. *See pages 12 and 13*

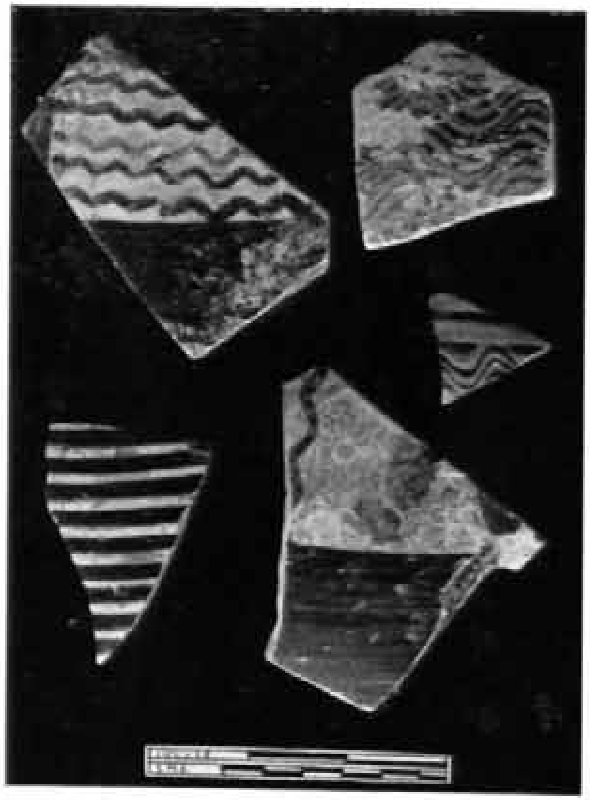


A



B

Lothal : painted pottery (A, $\frac{2}{3}$). See page 13



A

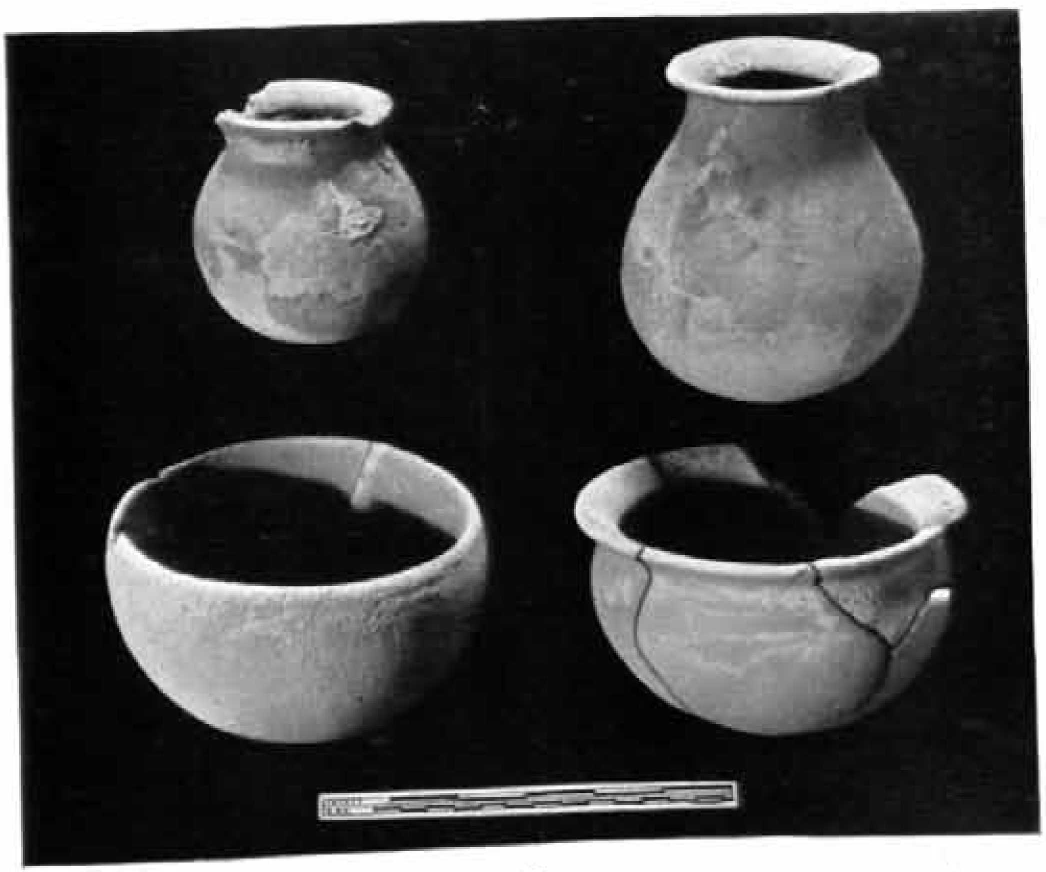


B

Lothal : painted and incised pottery. See page 13

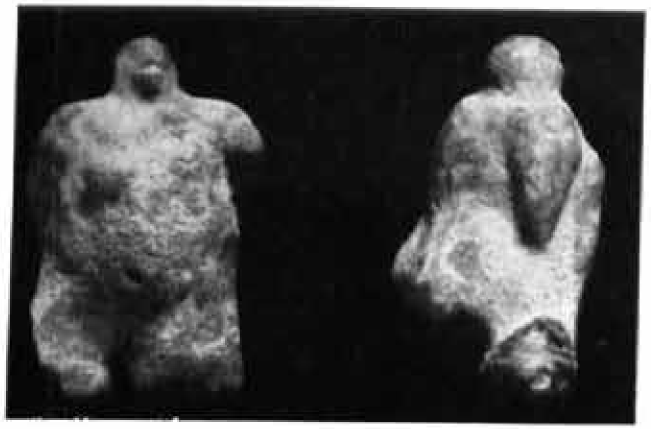


A



B

Lothal : A, *miniature painted vase;* B, *burial-pottery.* *See page 13*



A



B



C



D

Lothal : A, *terracotta guerilla, front and side views (ht.* $1\frac{1}{2}$ *in.)*; B, *terracotta mother-goddess (ht.* $2\frac{1}{2}$ *in.)*; C, *terracotta bearded figurine (ht.* $2\frac{1}{4}$ *in.)*; D, *terracotta animal figurines.* *See page 13*



A



B

Lothal : A, *stone weights and gamesmen;* B, *steatite and terracotta seals and sealings.* *See page 13*

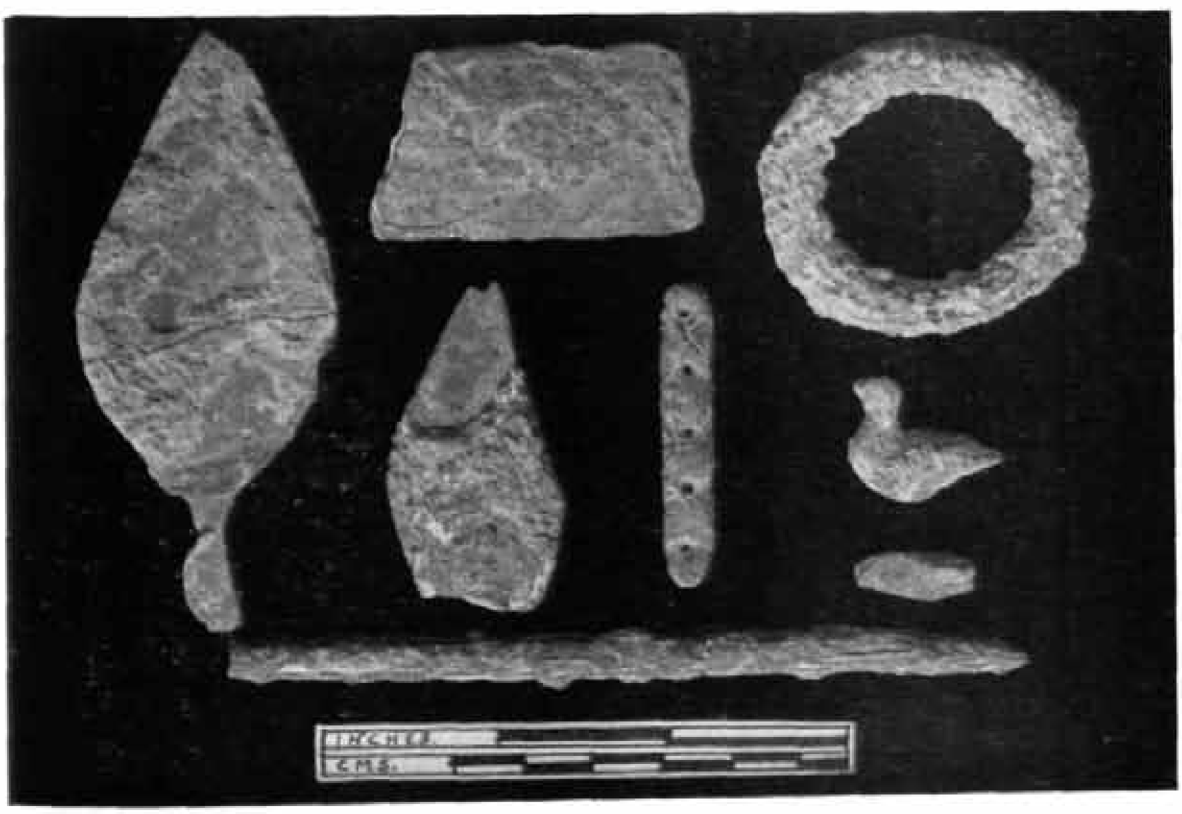


Lothal: 1, agate seal ($\frac{3}{1}$) ; *2 and 3, terracotta sealings* ($\frac{2}{1}$); *4, inscribed potsherd; 5-7, steatite seals (respectively* $\frac{3}{1}$, $\frac{2}{1}$ *and* $\frac{3}{4}$).

See page 13



A

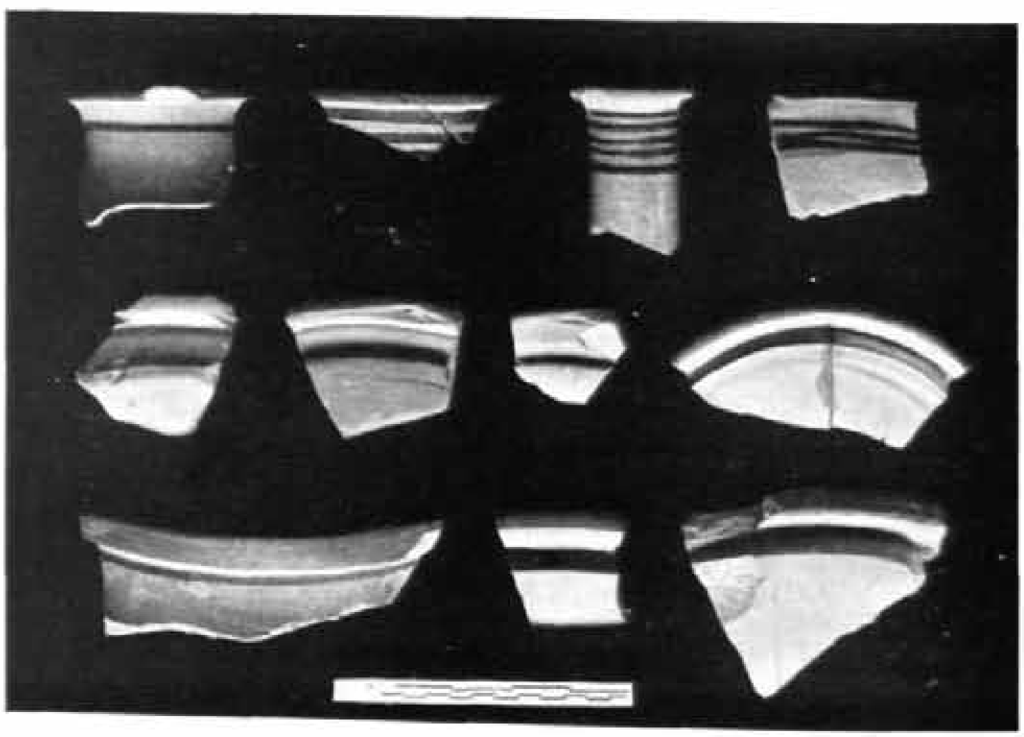


B

Lothal : copper and bronze objects. *See page 13*



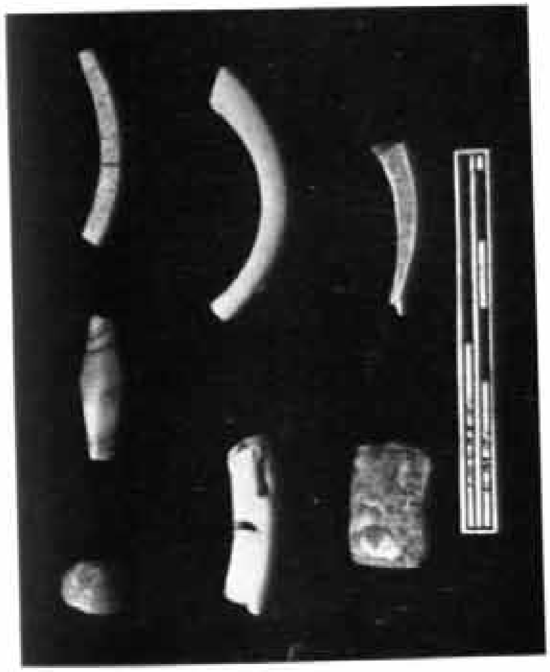
A. *Bhagatrav : pottery.* *See page 15*



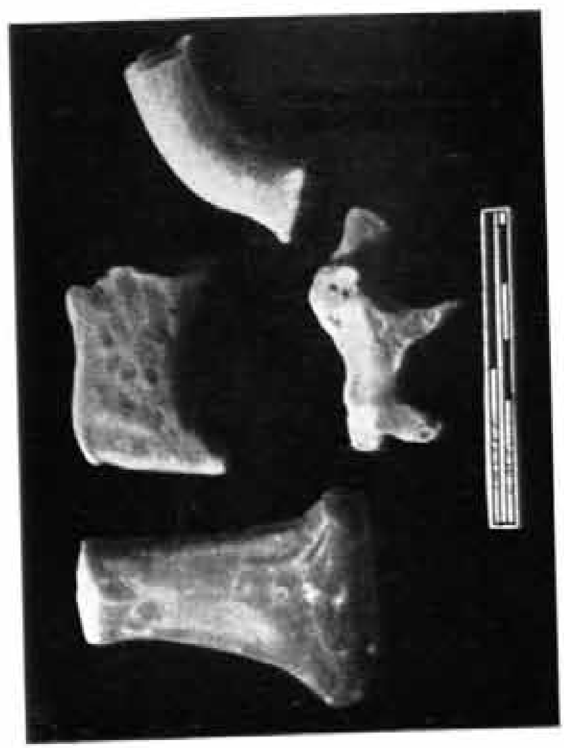
B. *Mehgam : pottery.* *See page 15*



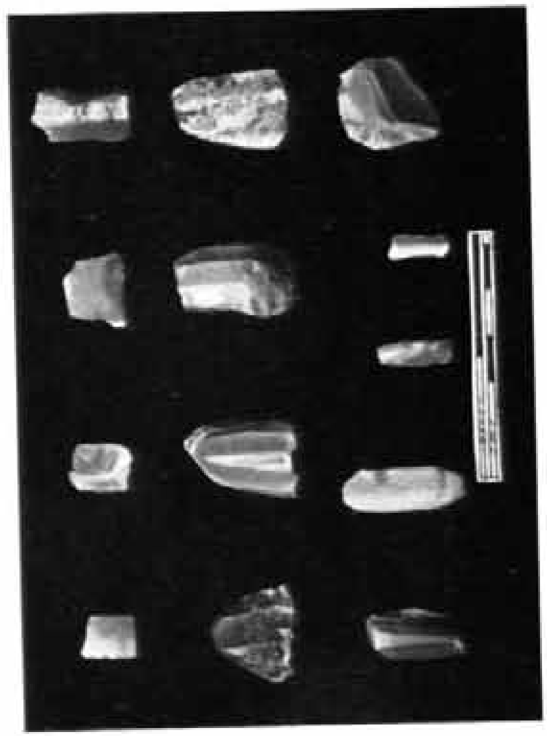
A. *Melgam : dish-on-stand.* *See page 15*



B. *Bhagatrav : carnelian bead, shell bangles and copper objects.* *See page 15*



C. *Bhagatrav : terracotta objects.* *See page 15*



D. *Bhagatrav : chert blades and fluted cores.* *See page 15*

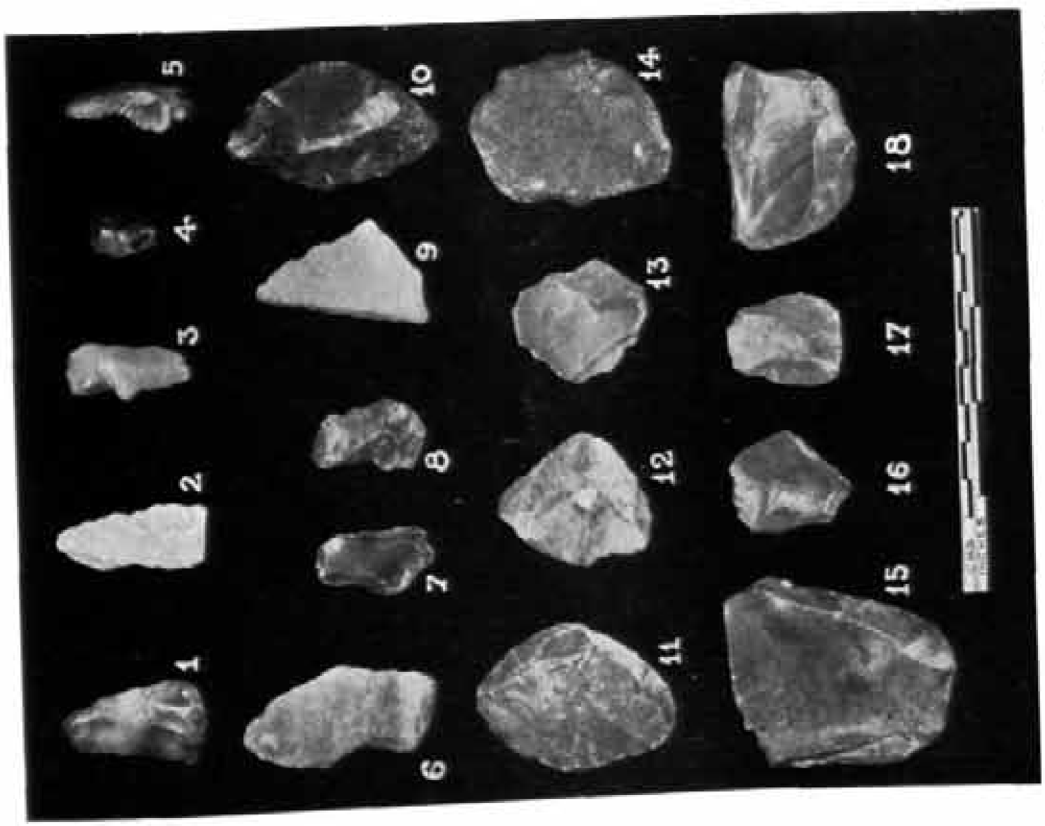


A

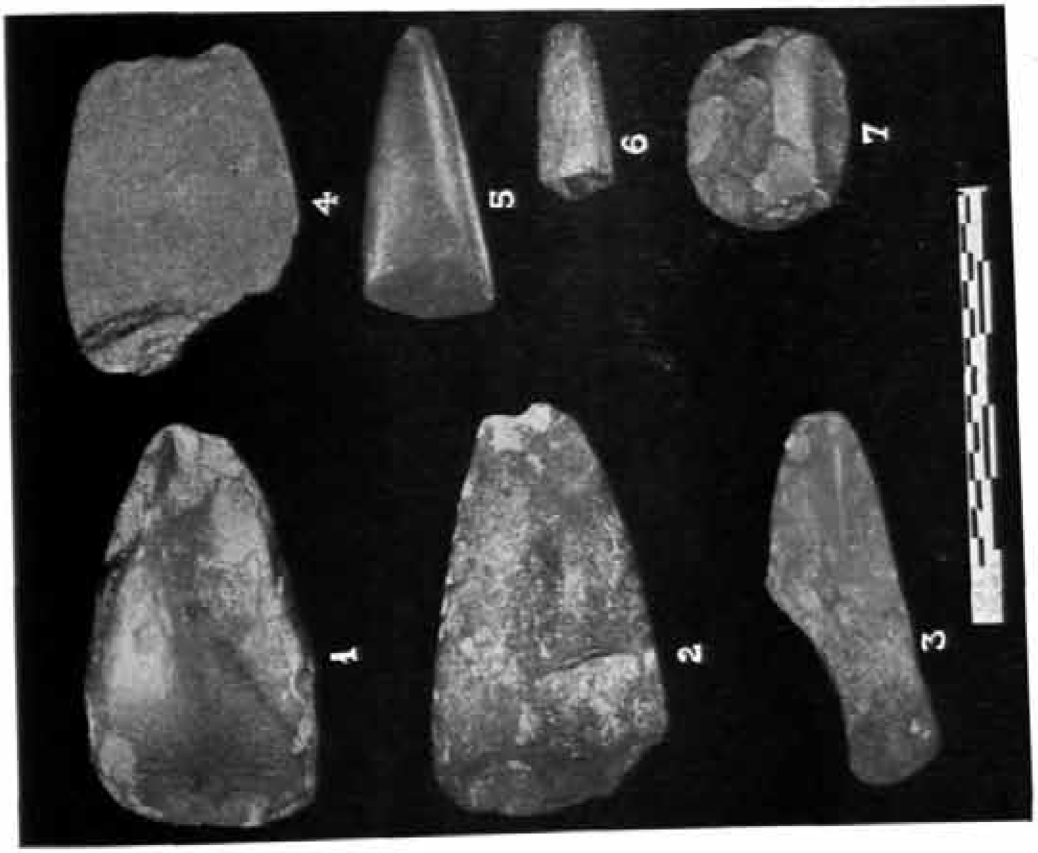


B

Adkot, Dad, Jhanjhmer, Pithadia, Rojdi and Sultanpur: miscellaneous pottery. See page 18



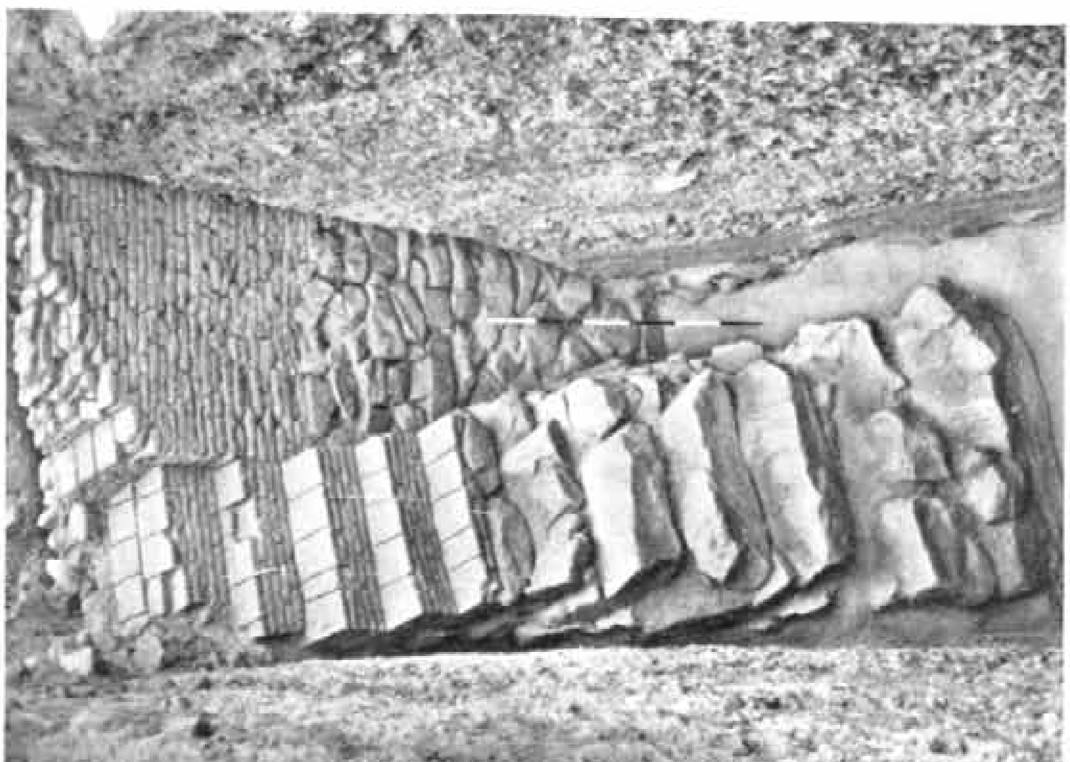
A. *Tools of Series II. Manjrod : 1-3 and 5; Thalner :4 and 6-18.*
See page 24



B. *Neolithic tools. Dulakheda : 1-3 and 5-7 ; Lekurwali : 4.*
See pages 24 and 39

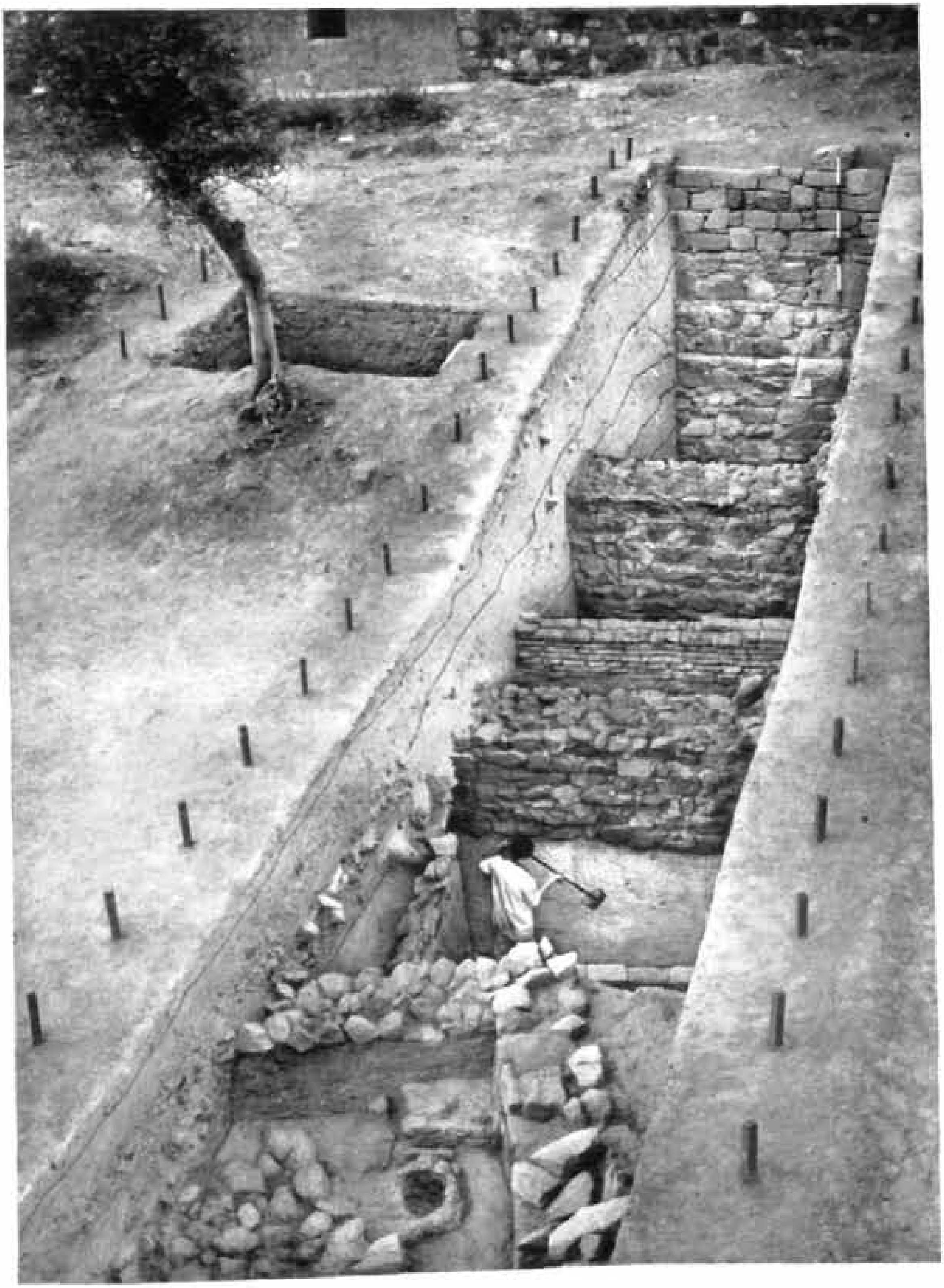


B



A

Lal-Kot (Delhi) : A, *stone wall and steps with brick restoration (scale of feet)*; B, *rubble-paved street with drain in centre and walls on sides (scale of feet)*. *See page* 25



Qila Rai Pithora (Delhi) : walls of different Periods with fortification-wall at back (scale of feet).
See page 25



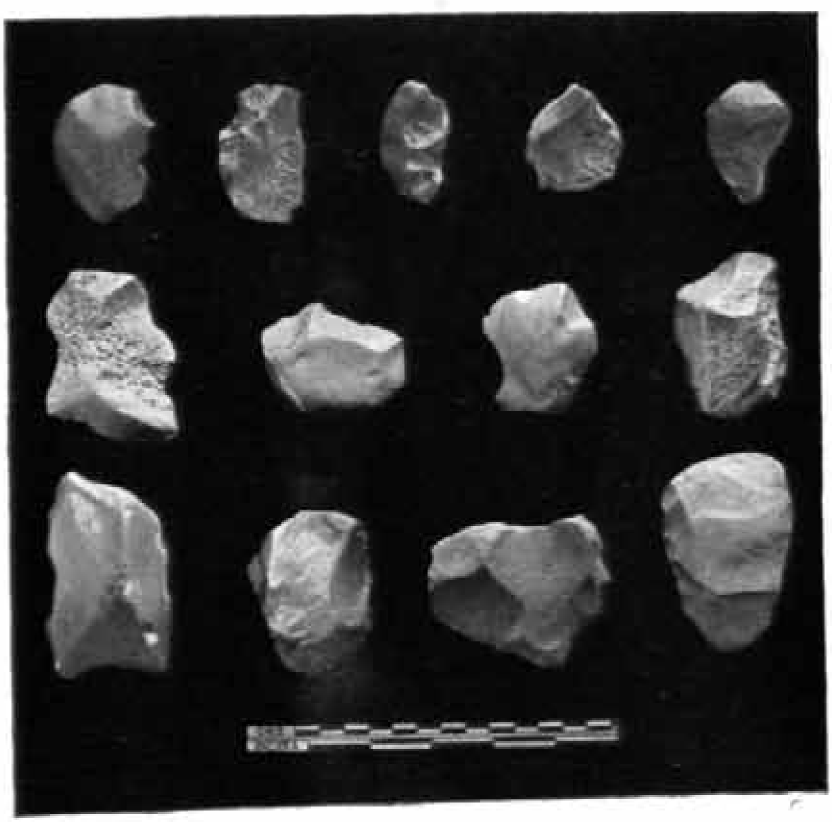
A. *Kohari : tools of Series I and II.* *See page 26*



B. *Ramnagar : tools of Series II.* *See page 26*



A. *Chorhat : tools of Series II.* *See page 26*



B. *Bira : tools of Series II.* *See page 26*

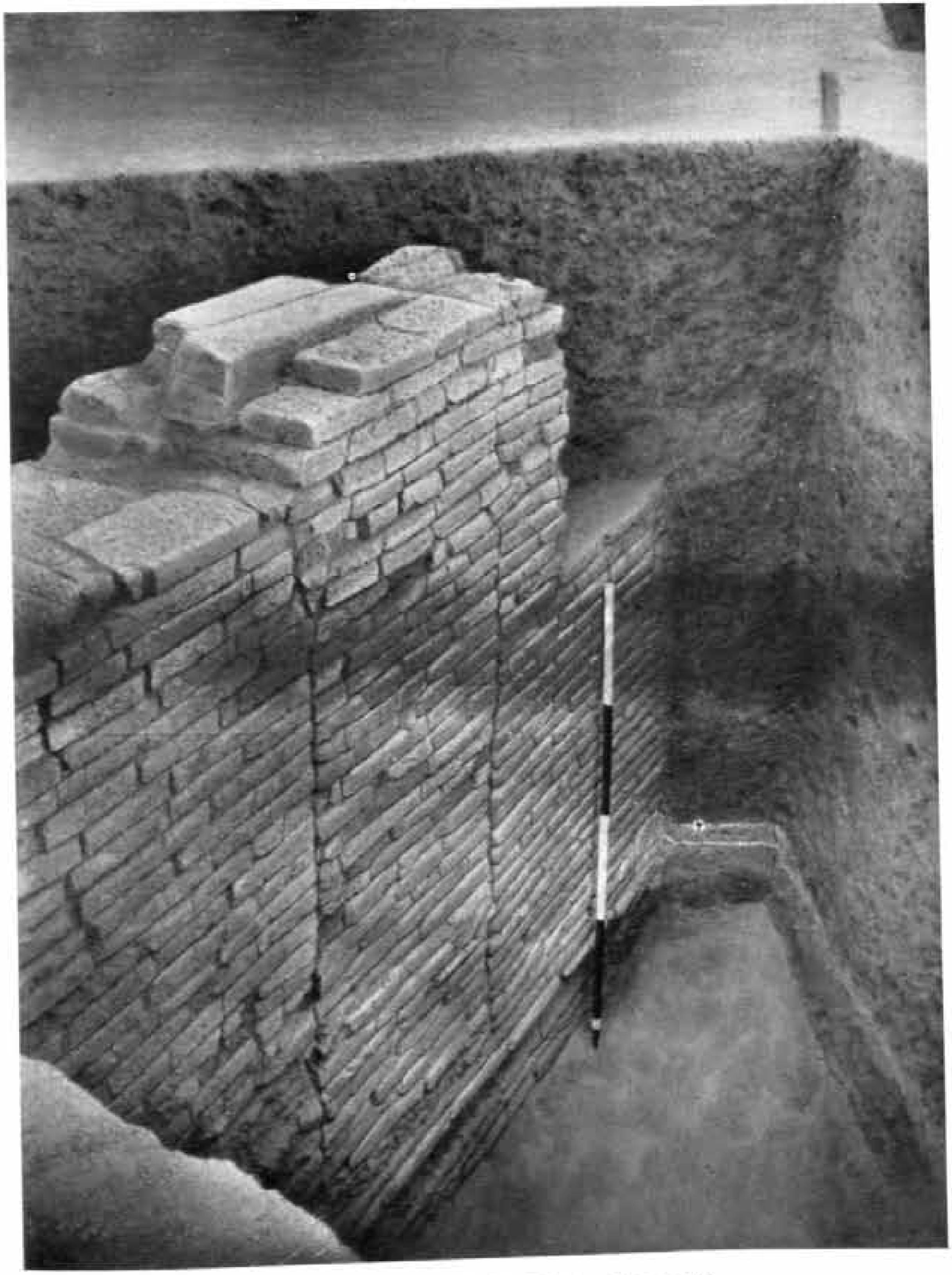


A

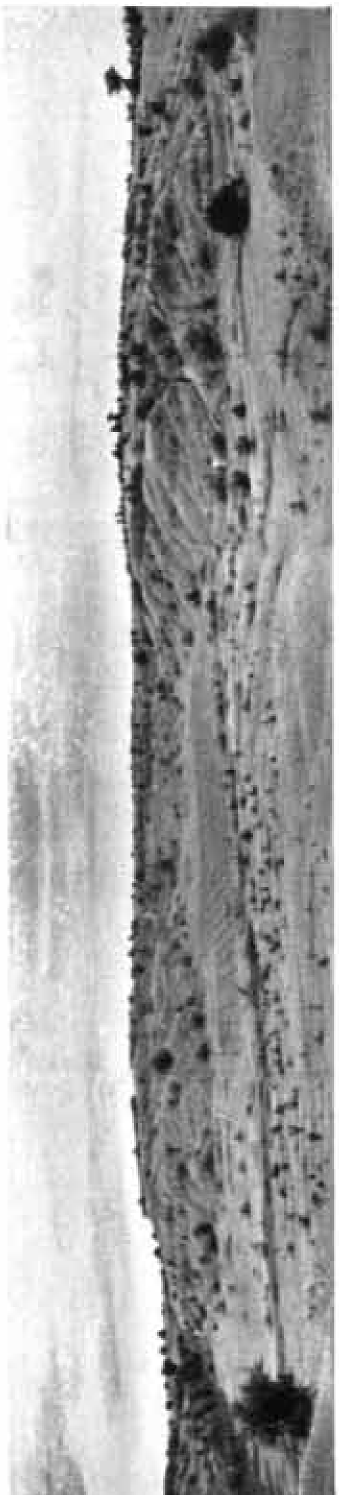


B

Deoland Bridge : tools of Series II. See page 26



Pasewa : brick wall (scale of feet). See page 28



A

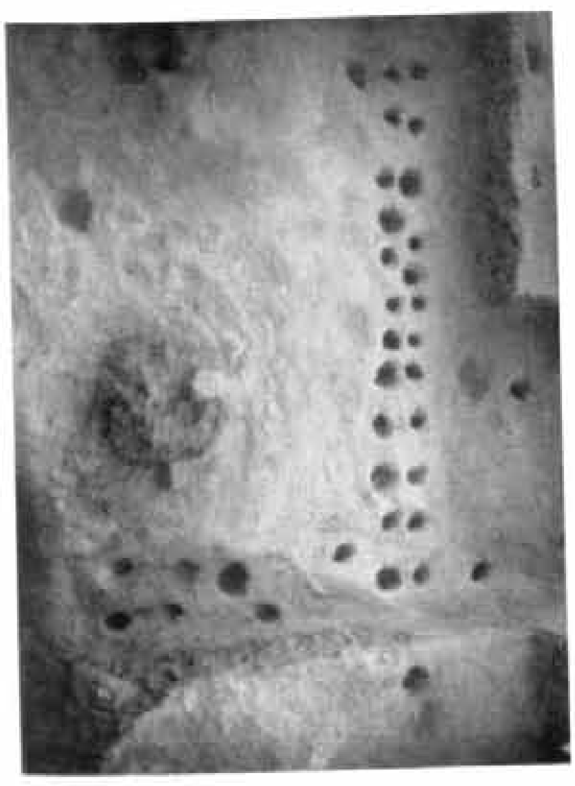


B



C

Navdatoli : A, *general view of Mound 4;* B, *latest occupation with pebble-filling (scale of inches);* C, *earliest occupation with two circular structures (scale of feet).* *See pages 30-32*



A



B



C



D

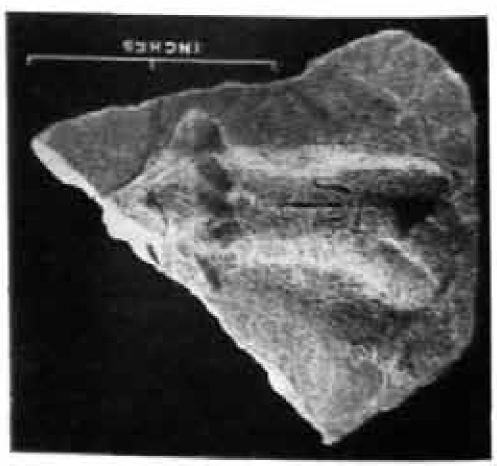
Navdatoli : A, *double row of post-holes* ; B, *corner of house with pots in situ*; C, *hearth plastered with clay and lime* ; D, *terracotta pot-rest*. *See pages 30-32*



A



B

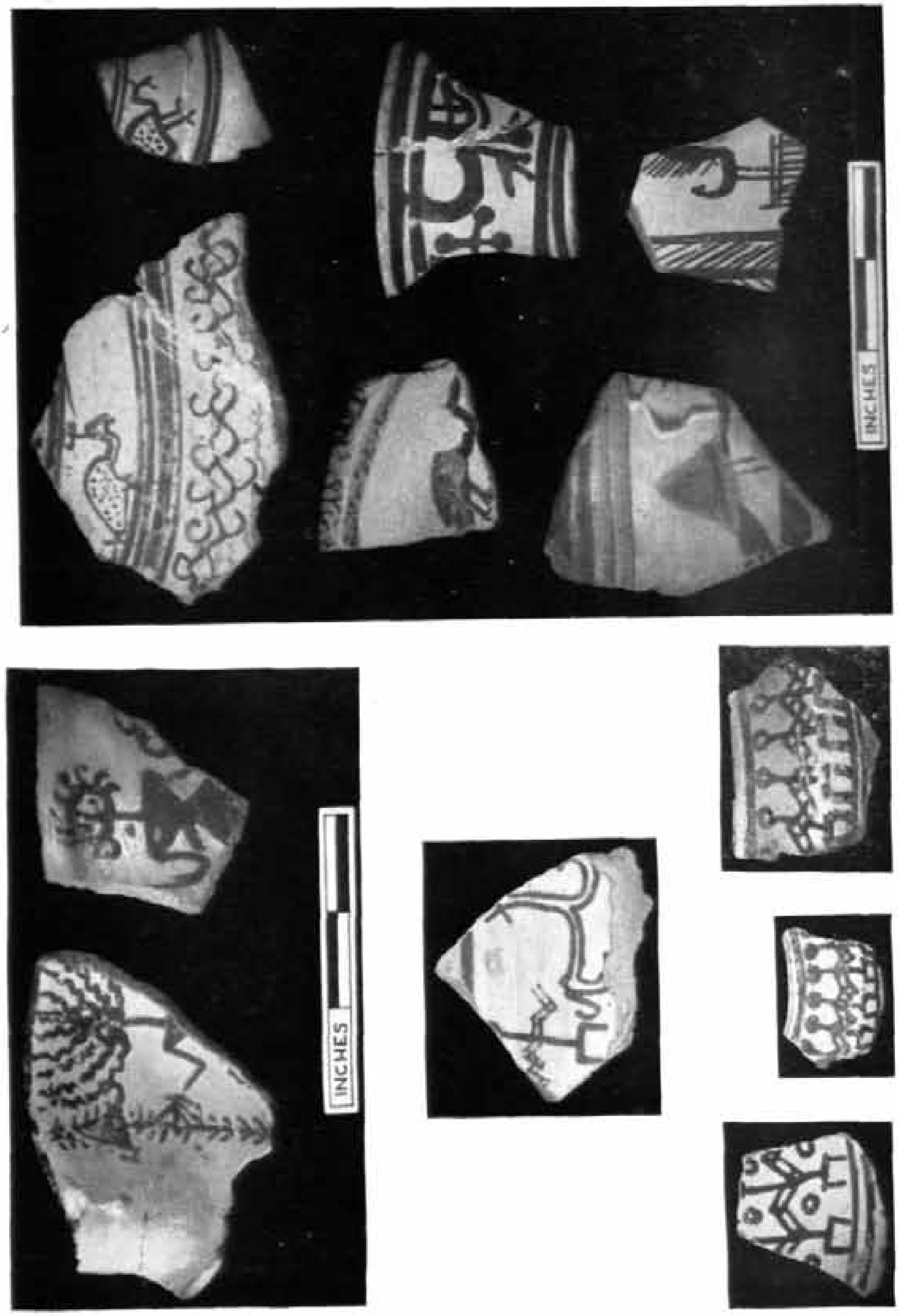


C



D

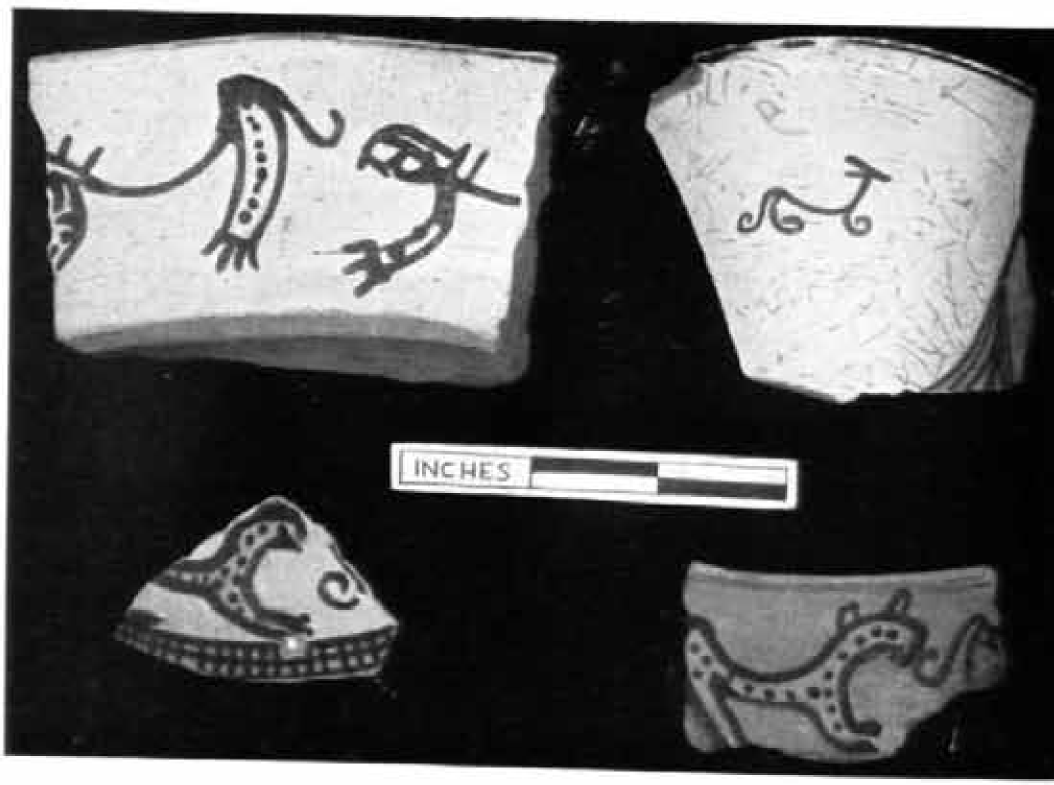
Navdatoli : A-C, pottery with applied figurines; D, channel-spouted cup. *See page 32*



Navdatoli : painted pottery. See page 32

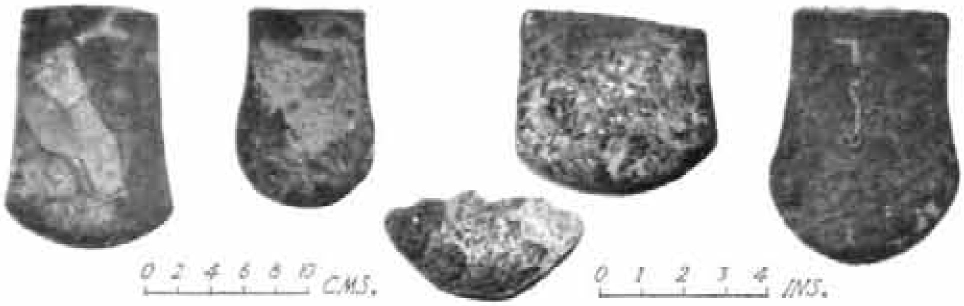


A

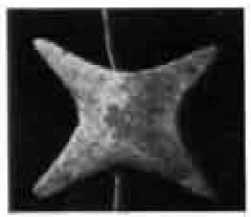


B

Navdatoli : painted pottery. *See page 32*



A

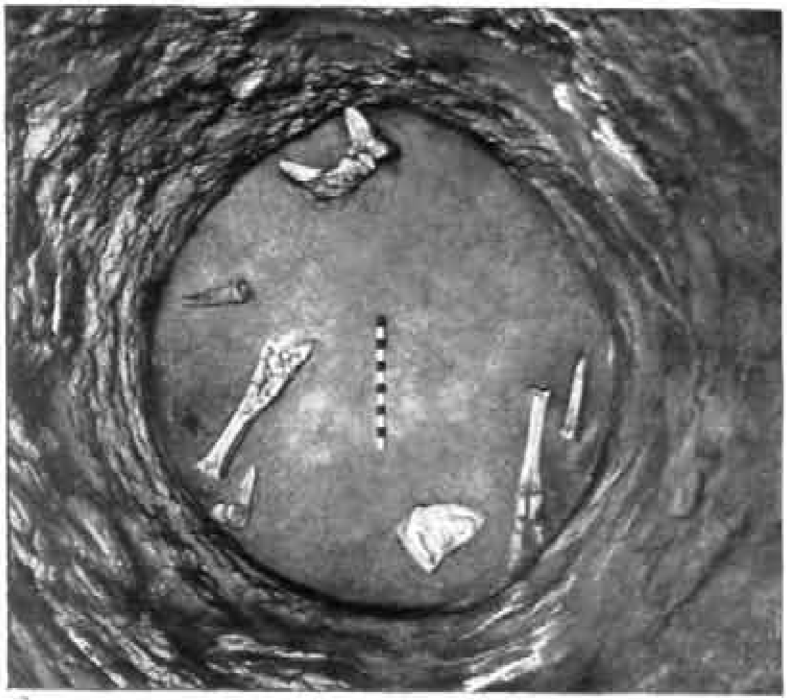


B

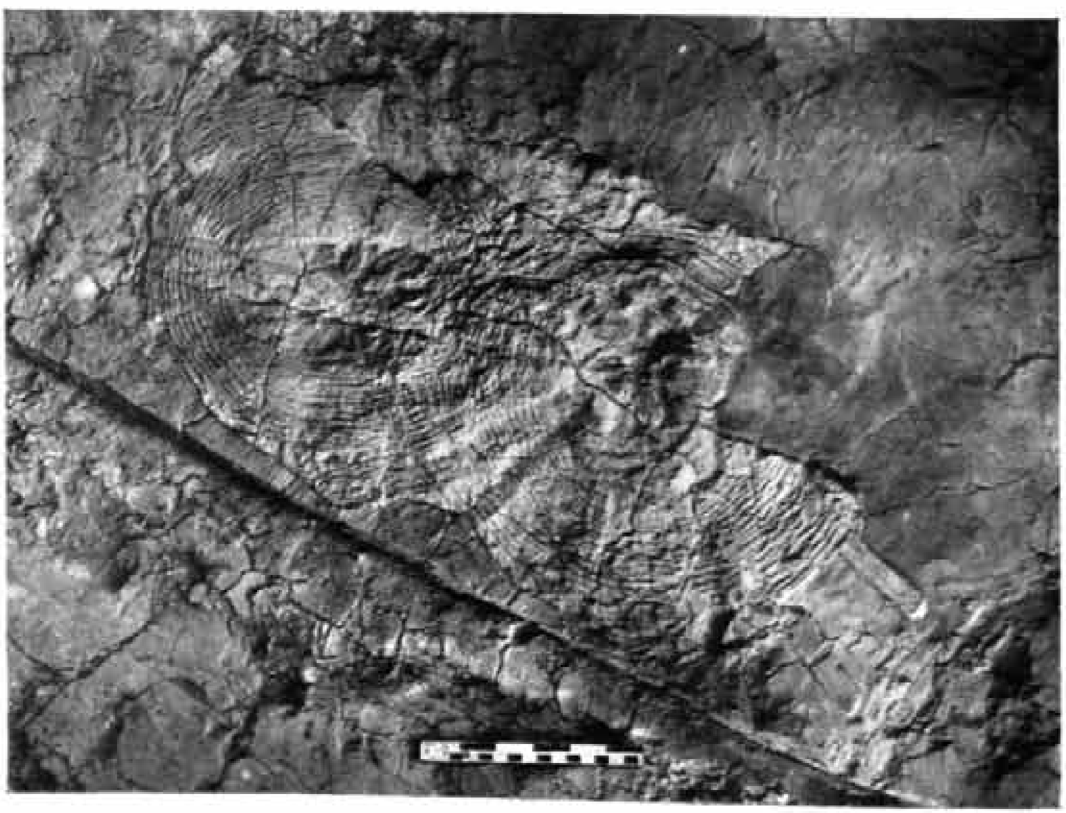


C

Navdatoli : A, *copper axes;* B, *star-shaped faïence bead* (1/1); C, *microlithic blades.* *See page 32*



A



B

Ujjain : A, *cattle-bones in pit (scale of inches)*; B, *impressions of baskets on clay in make-up of rampart.*
See page 34

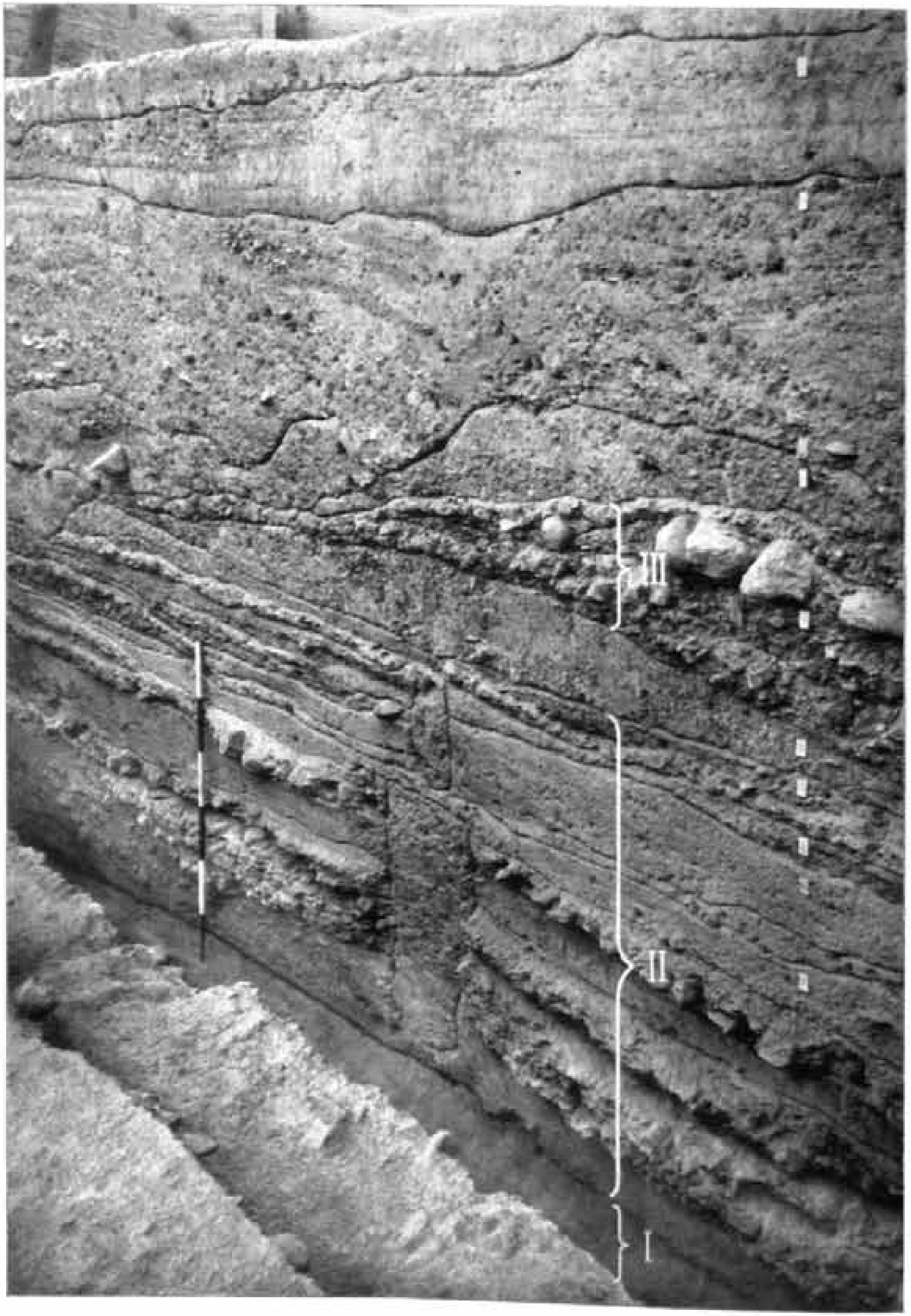


A



B

Ujjain : A, *retaining walls of different Periods at rear end of moat* (*scale of feet*); B, *human skull in moat*. *See page 34*



Ujjain : section of roads of different Periods (scale of feet). See page 34

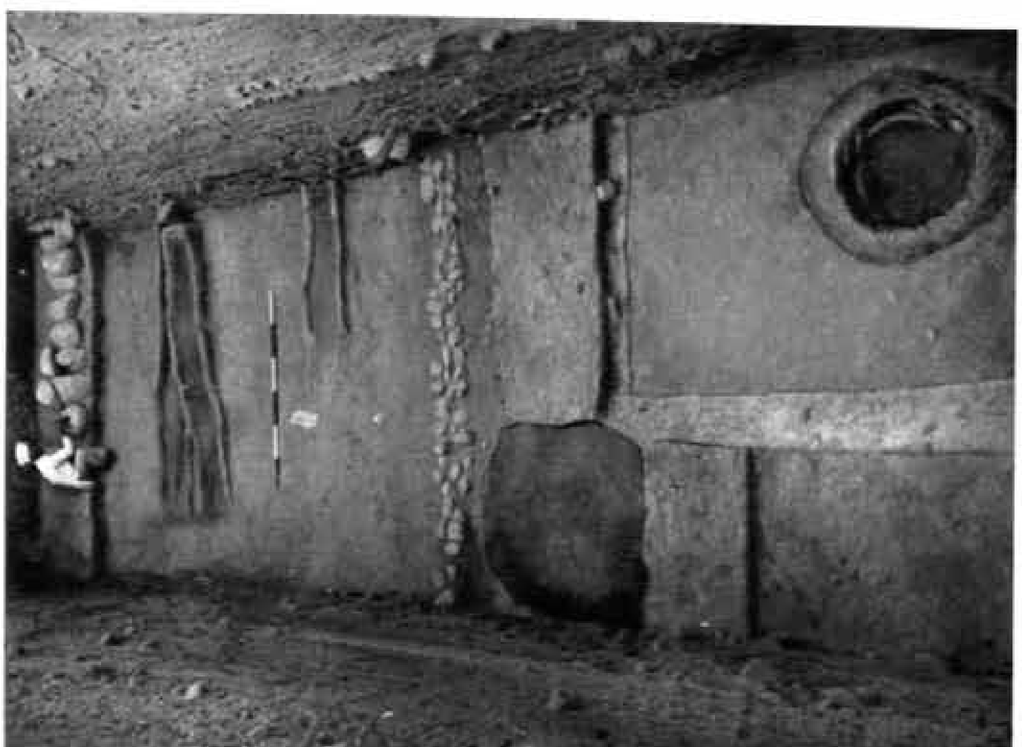


A



B

Ujjain : A, *wooden construction in make-up of rampart (scales of feet and foot-and-inches)*: B, *ironsmith's furnace (scale of inches)*. *See pages 34 and 36*



A



B

Ujjain : A, *oblong furnaces associated with bead-manufacture (scale of feet)*; B, *walls and ring-wells of different Periods, tank of Period II in foreground (scale of feet)*. *See pages 34 and 36*

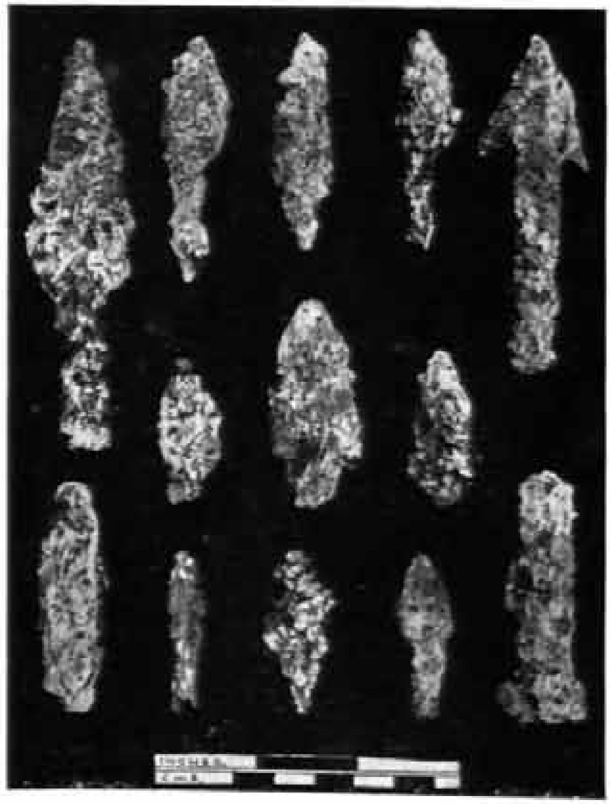


A



B

Ujjain: A, *revetment-wall at south-west end of channel (scale of feet)*; B, *collapsed manufactory of bone arrow-heads (scale of foot-and-inches)*. *See page 36*



A



B

Ujjain : iron objects. *See page 36*



A



B

Kunnattur : A, Megalith 5 with central sarcophagus and three sarcophagi, marked A-C, near the top (scales of feet and foot-and-inches); B, Megalith 5, central sarcophagus (scale of feet). See page 37

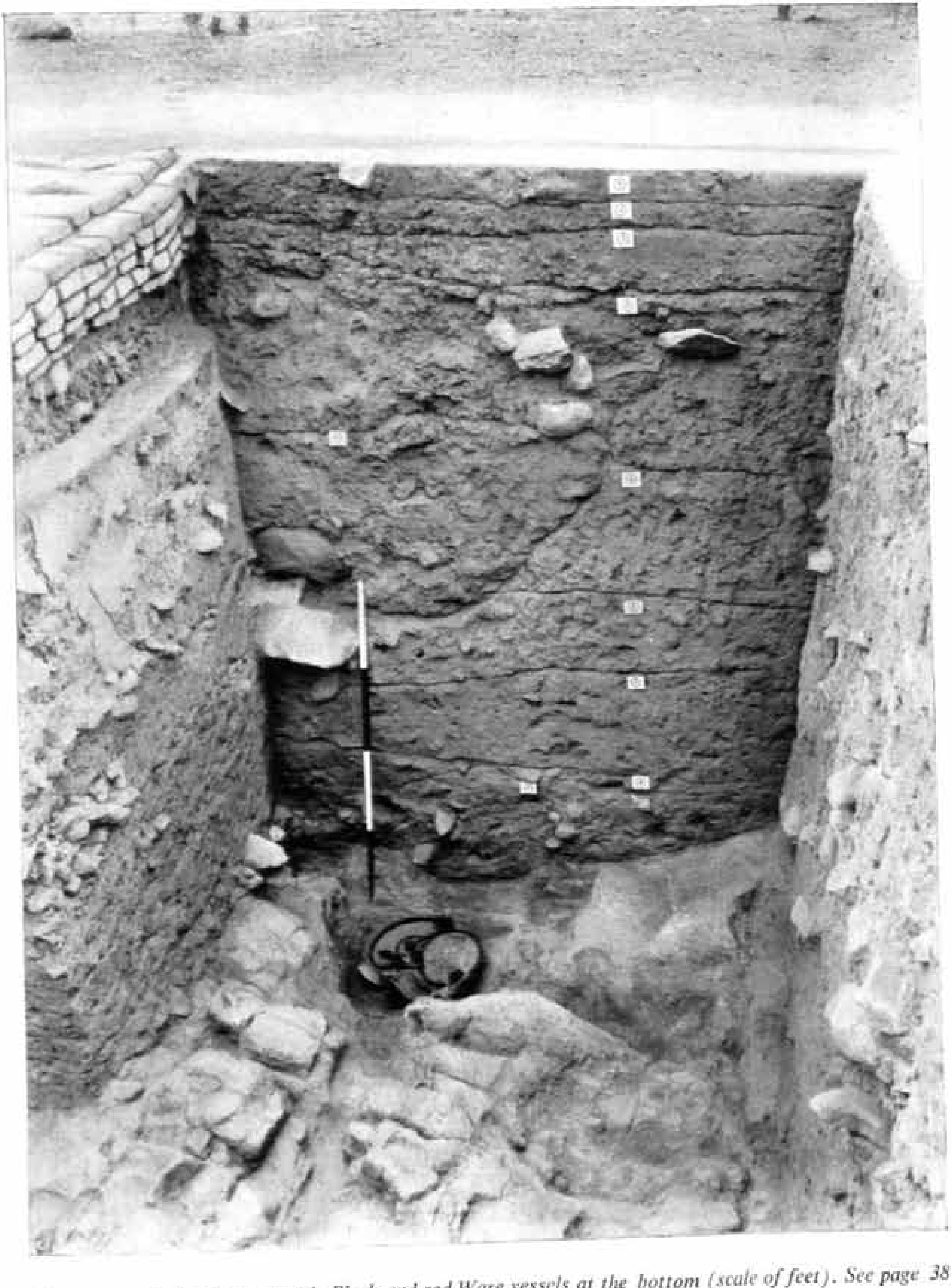


A

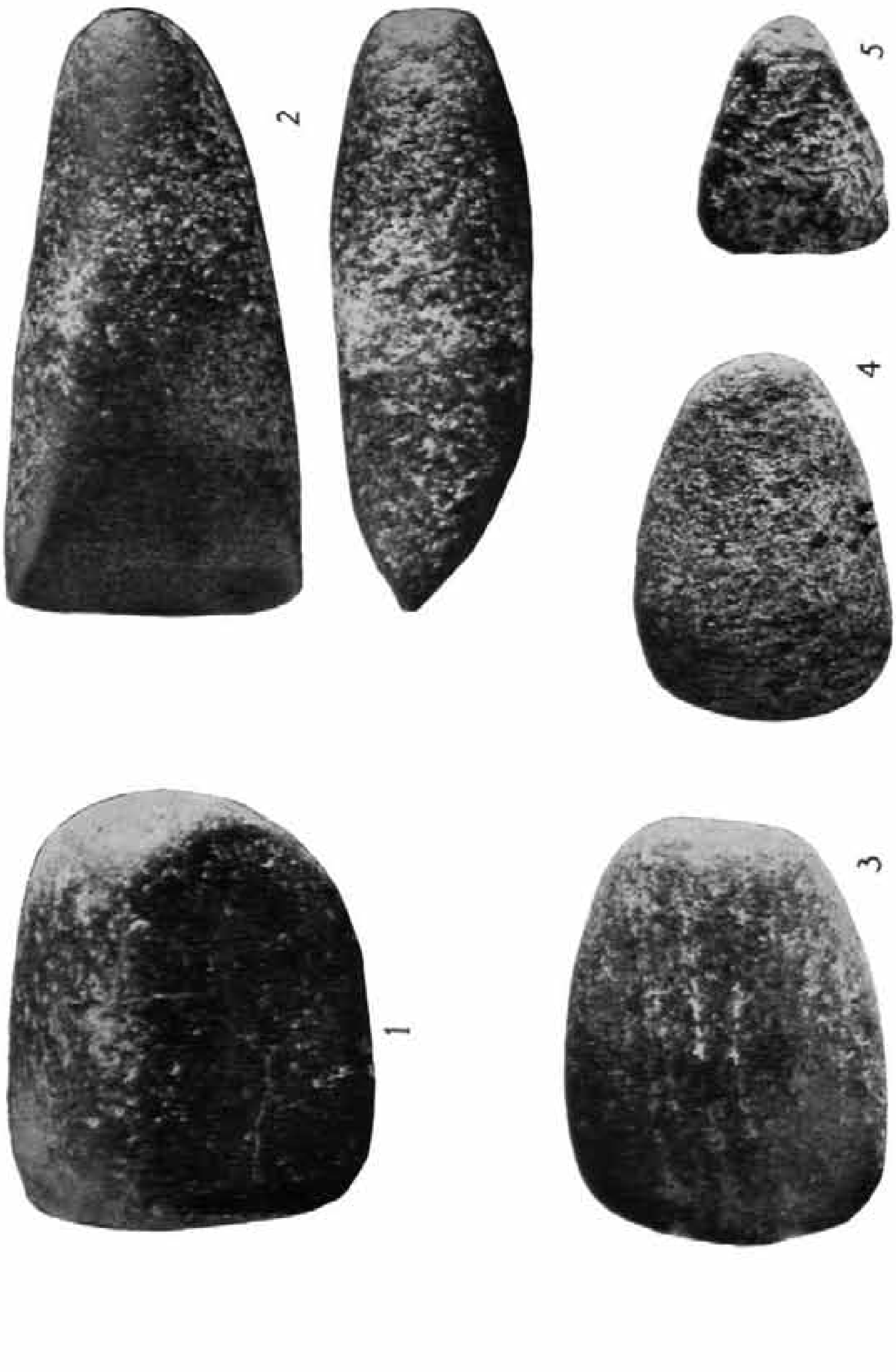


B

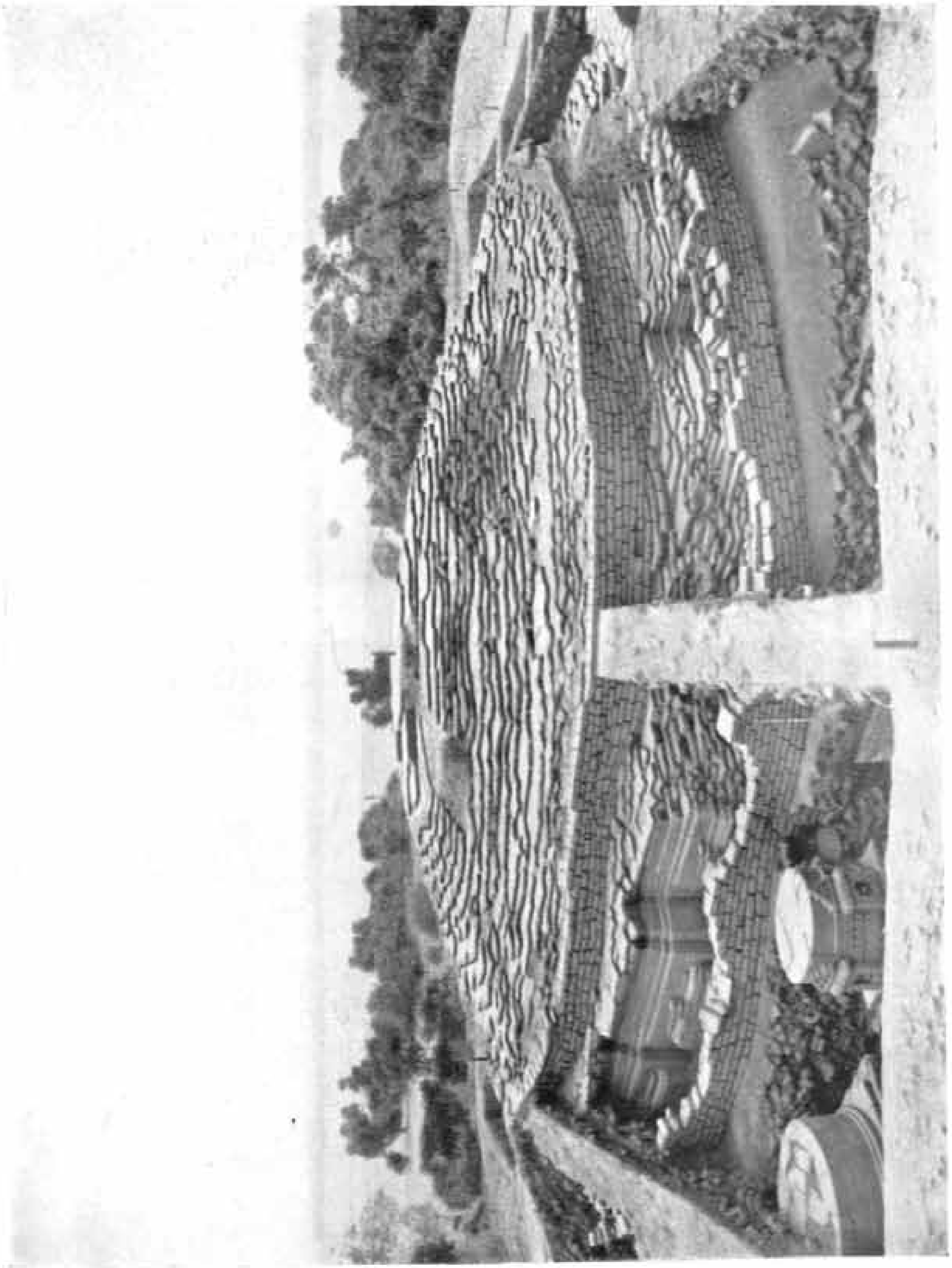
Kunnattur : A, *Megalith 9, sarcophagus with bones, iron objects and pottery (scale of inches)*; B, *Megalith 4, stone-lined pit with iron objects and pottery (scale of foot-and-inches)*. *See page 37*



Kunnattur : habitation-site with Black-and-red Ware vessels at the bottom (scale of feet). See page 38



Neoliths. *Sircarsanakkulam* : 1 and 2 : *Kollanpatrai* : 3 and 4 : *Karuvelampatti* : 5. (1/1). See page 38



Ratnagiri : main stupa (scale of foot-and-inches). *See page 39*



A



B

Ratnagiri : A, *main stupa with flanking votive stupas on different levels (scale of foot-and-inches);* B, *close view of votive stupas (scale of foot-and-inches).* *See page 40*



A



B

Ratnagiri : clusters of monolithic votive stupas (scales of foot-and-inches). *See page 40*



A



B

Ratnagiri : A, *later circular walls over ruined wall-tops of earlier stupa (scale of foot-and-inches)*; B, *other later walls (scale of foot-and-inches)*. *See pages 40 and 41*



A



B

Ratnagiri : A, *pedestal of monolithic votive stupa with socket filled with ashes and bones ;*
B, *base of monolithic votive stupa with plugged socket.* *See page 40*



A



B

Ratnagiri: A, *Arya-Sarasvati (?), and* B, *Vajrasattva, in niches of votive stupas.* *See page 40*



A



B



C



D

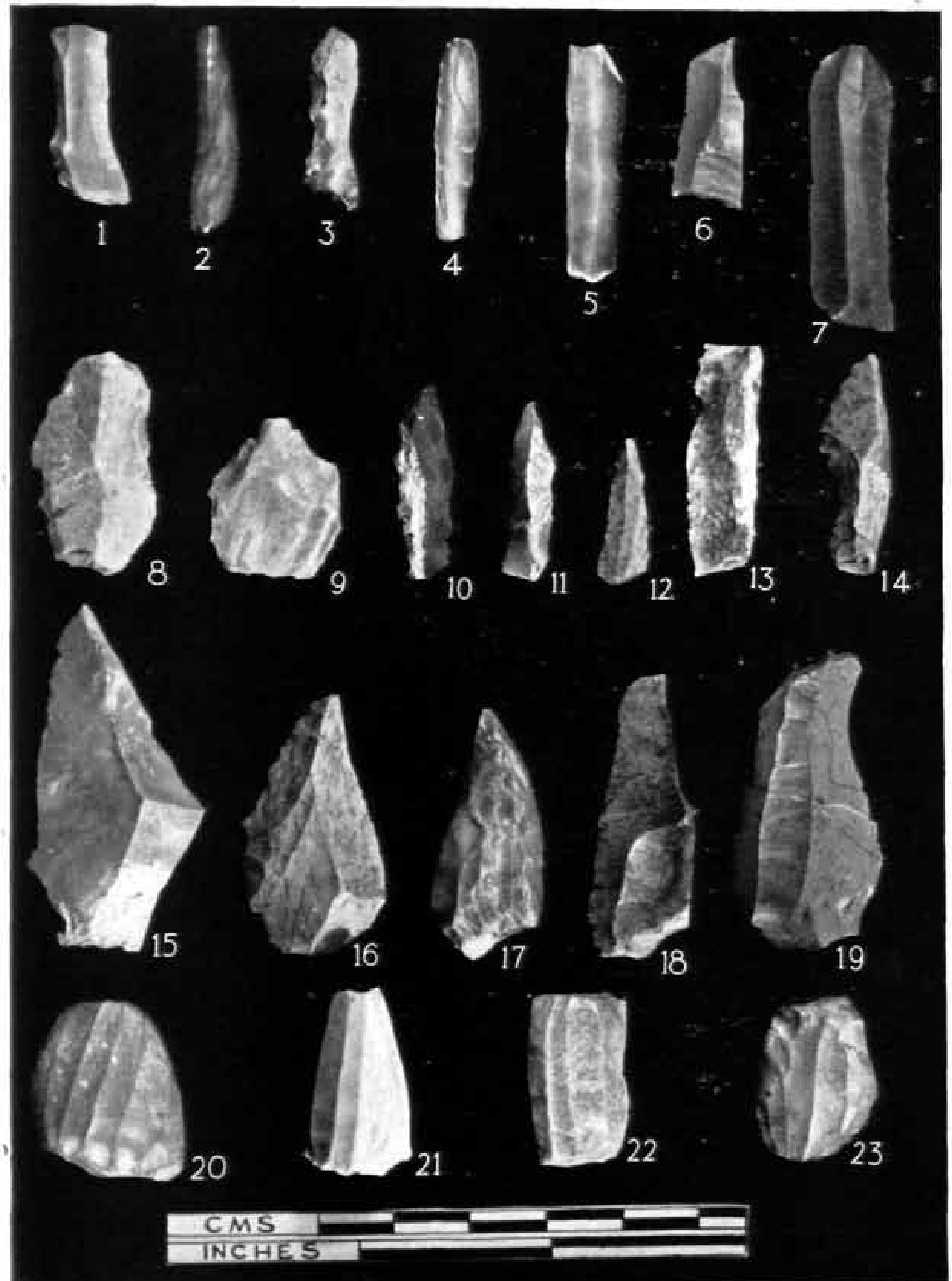
Ratnagiri: stone sculptures representing, A, *Arapachana*, B, *Tara*, C, *Lokesvara*, and D, *Aparajita* (?).

See page 41



A B C D E F

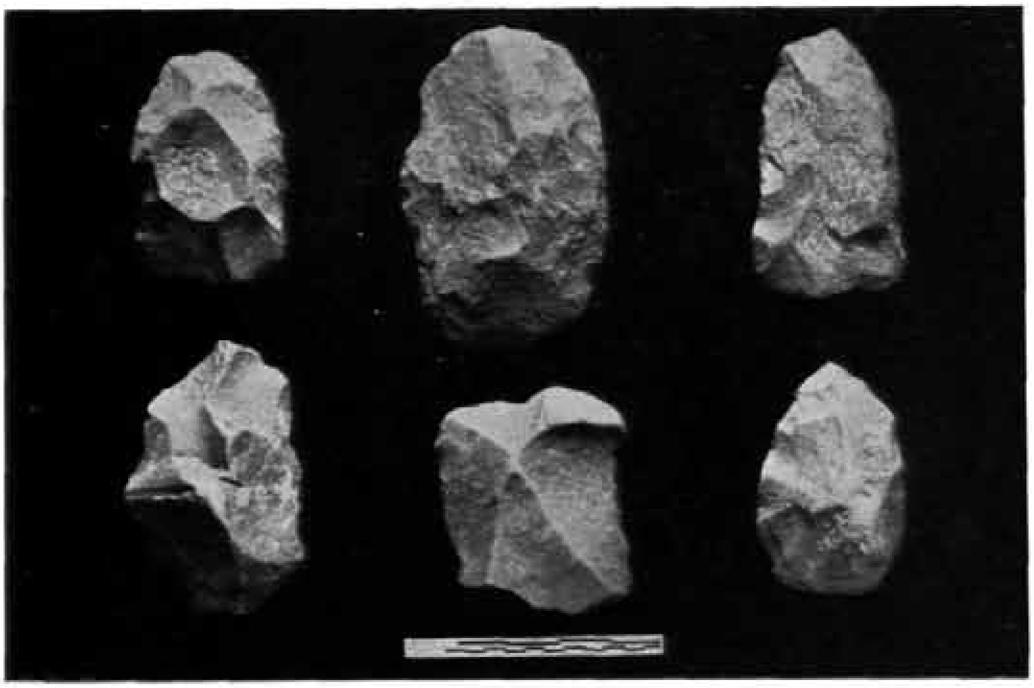
Ratnagiri : stone sculptures representing, A *and* C, *Buddha,* B *and* F, *Tara,* D, *Vajra-Tara,* E, *lower part of a deity on decorated pedestal (ht. 1½ in.).* *See page 41*



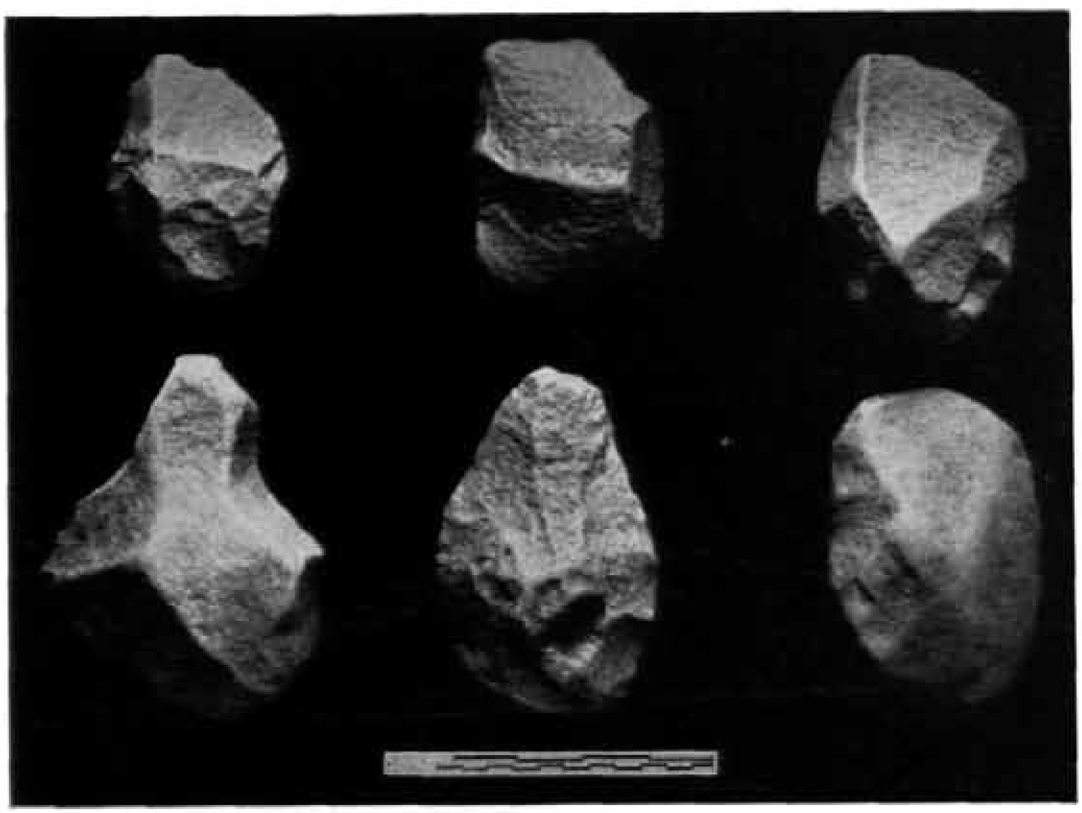
Microliths. Uncha : 1 and 13 ; Giga Khera : 2-7, 10 and 19 ; Ballu Khera : 8, 9, 12 and 22 ; Deoli : 11 ; Kurias : 14 and 23 : Purani Marmi : 15, 17, 18, 20 and 21 ; Goga Thala : 16. See page 45



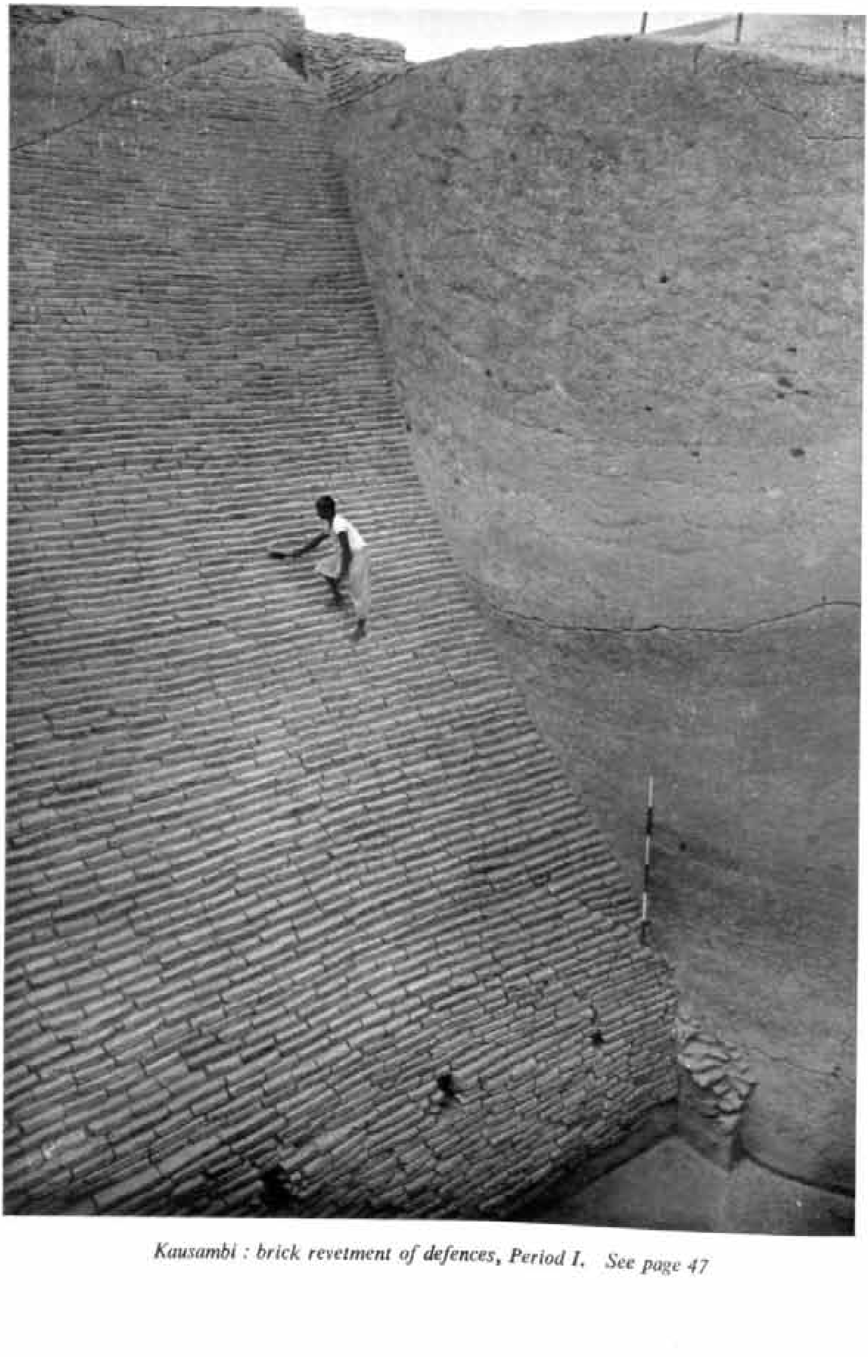
Bhagwanpura, Kadukota, Kumaria, Pachimto and Purani Marmi : painted black-and-red and red pottery.
See page 45



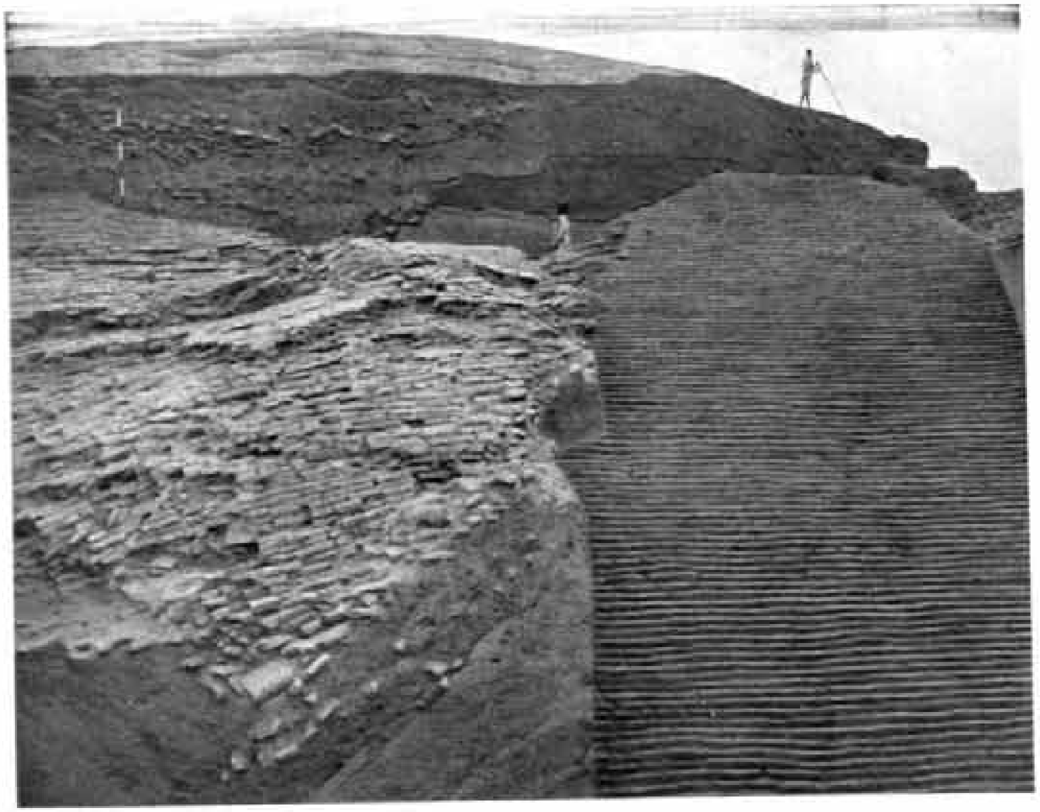
A. *Bichore : palaeoliths.* *See page 45*



B. *Shamaria no. 1 : palaeoliths.* *See page 45*



Kausambi : brick revetment of defences, Period I. See page 47



A



B

Kausambi : A, *brick revetments of defences, Periods I and II, the latter collapsed (scale of feet);* B, *brick revetments of defences, Periods II and III (scale of feet).* *See page 47*



A



B

Kausambi : guard-rooms, stairs and other structures of different Periods (scales of feet).
See pages 47 and 48



A

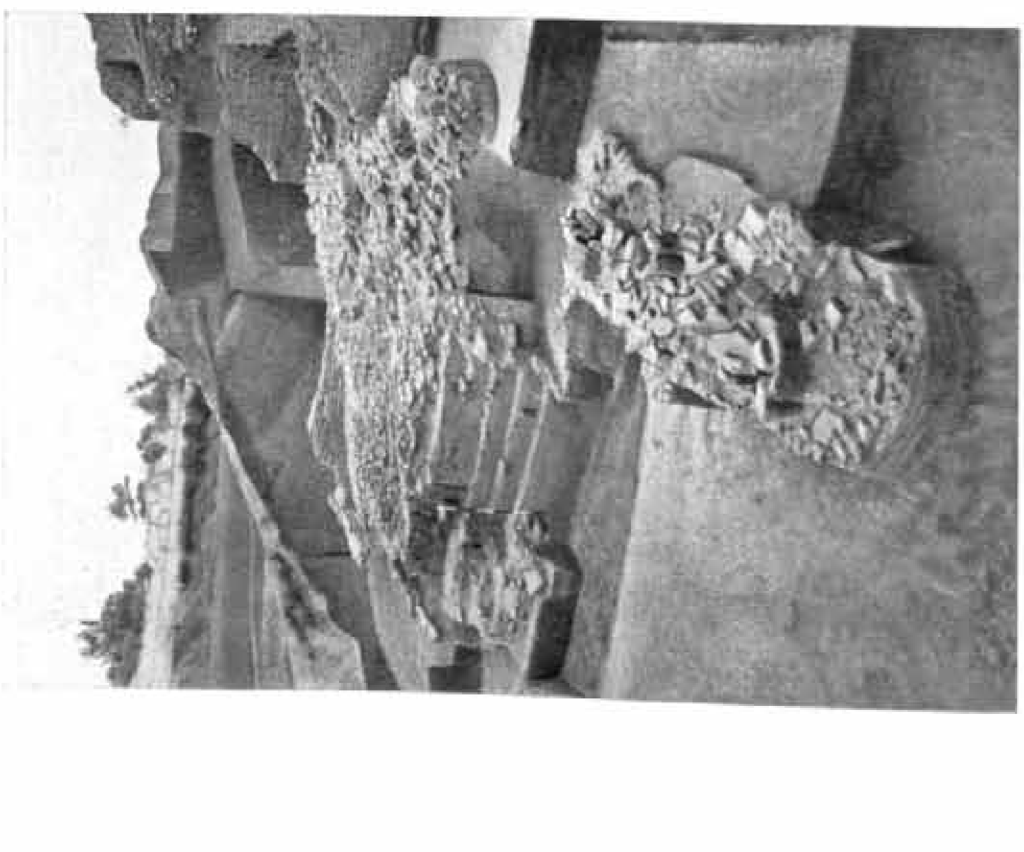


B

Kausambi : A, *syena-chiti, structures of defences in background;* B, *curved wall with drain or passage (scale of feet).* *See pages 47 and 48*



B



A

Kausambi : A, *syena-chiti* (*scale of feet*); B, *corbelled drain or passage* (*scale of inches*). *See pages 47 and 48*

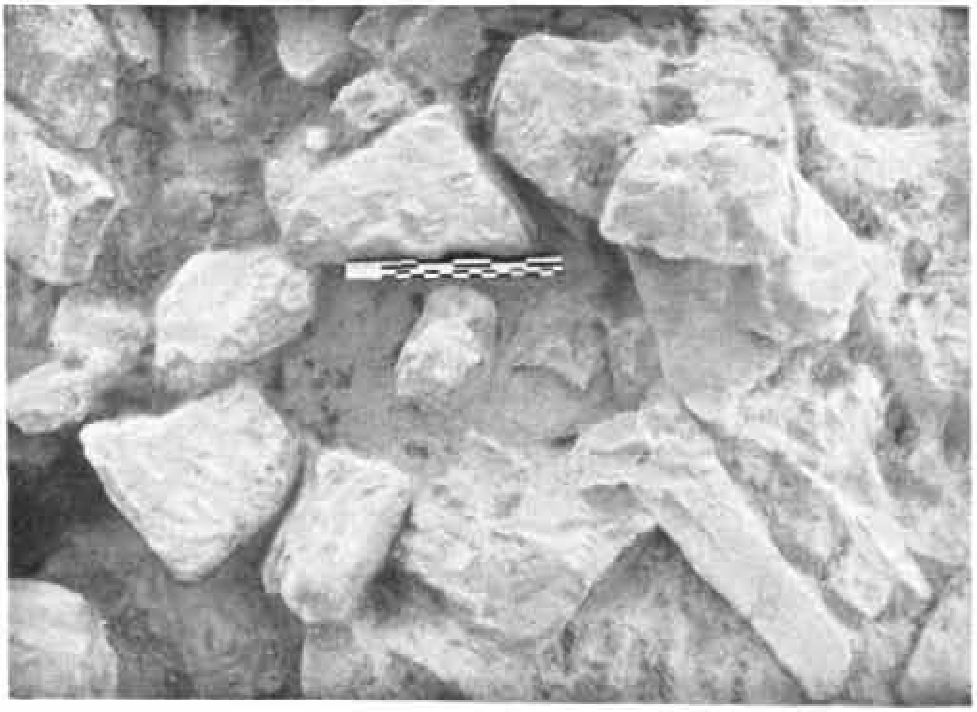


A



B

Kausambi : A, *bones on syena-chiti (scale of inches)*; B, *stages in the construction of syena-chiti (scales of feet-and-inches)*. *See pages 48 and 49*

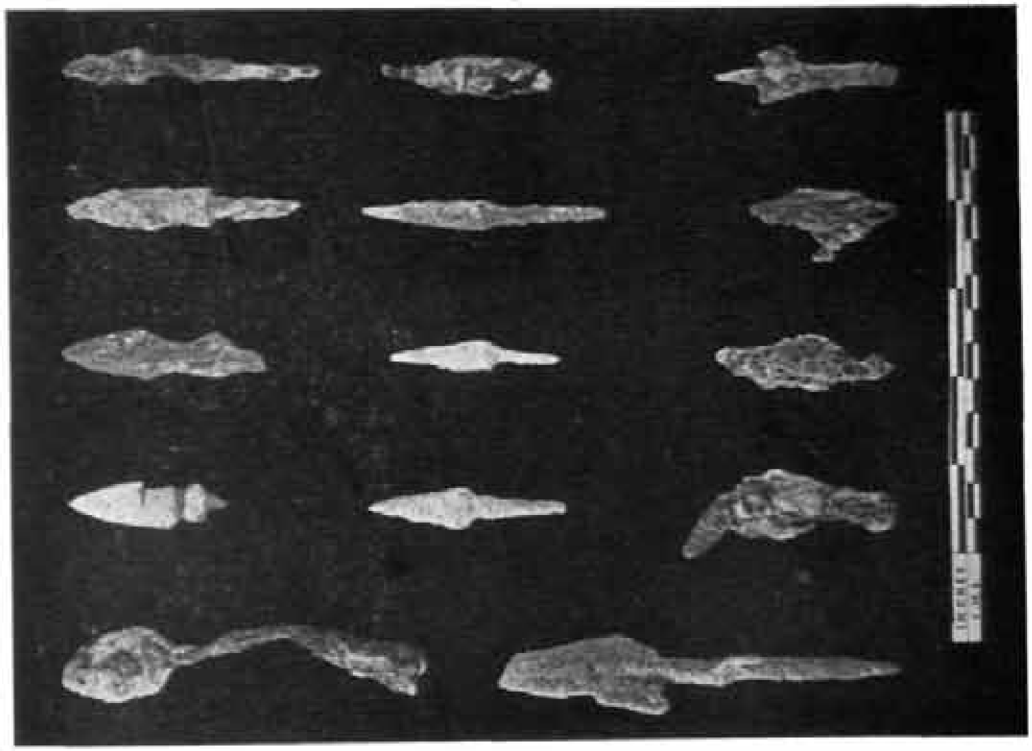


A



B

Kusambi : A, *svayamatrina enclosed by bricks on syena-chiti* ; B, *jars and human skull on syen-chiti*.
See pages 48 and 49

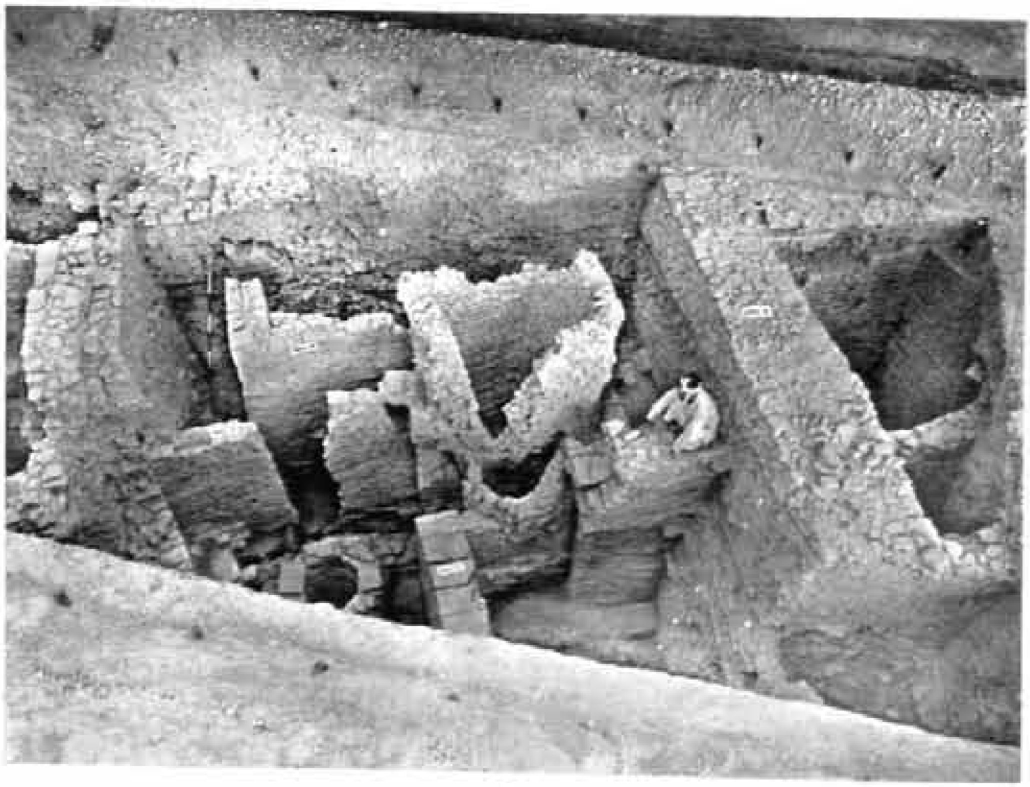


B

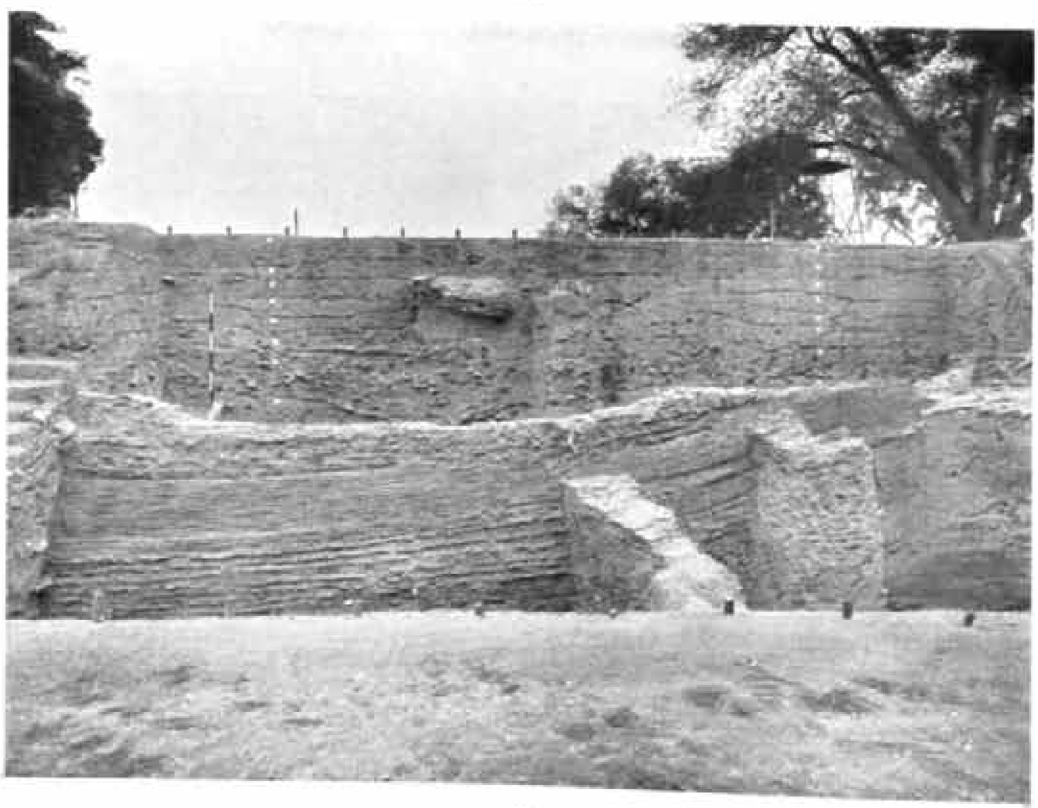


A

Kausambi : A, *terracotta figurines;* B, *iron objects.* *See page 48*



A



B

Rajghat (Varanasi) : structures of different Periods (scales of feet). *See page 51*



A

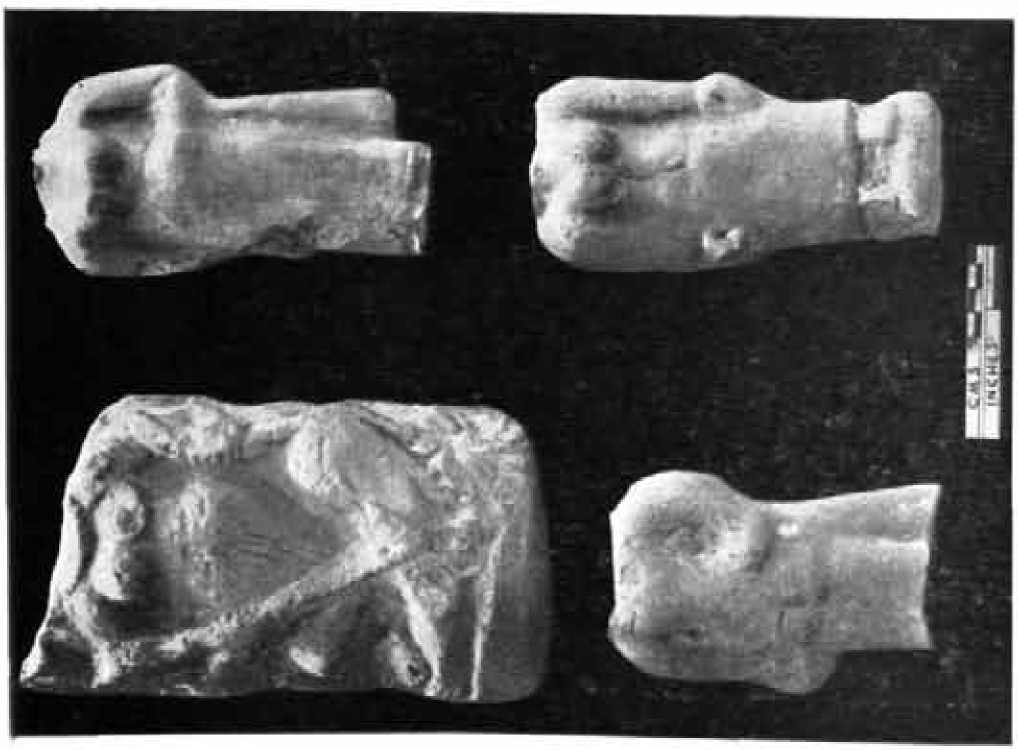


B

Rajghat (Varanasi); A, *pottery spouts;* B, *decorated sherds. See pages 50 and 51*

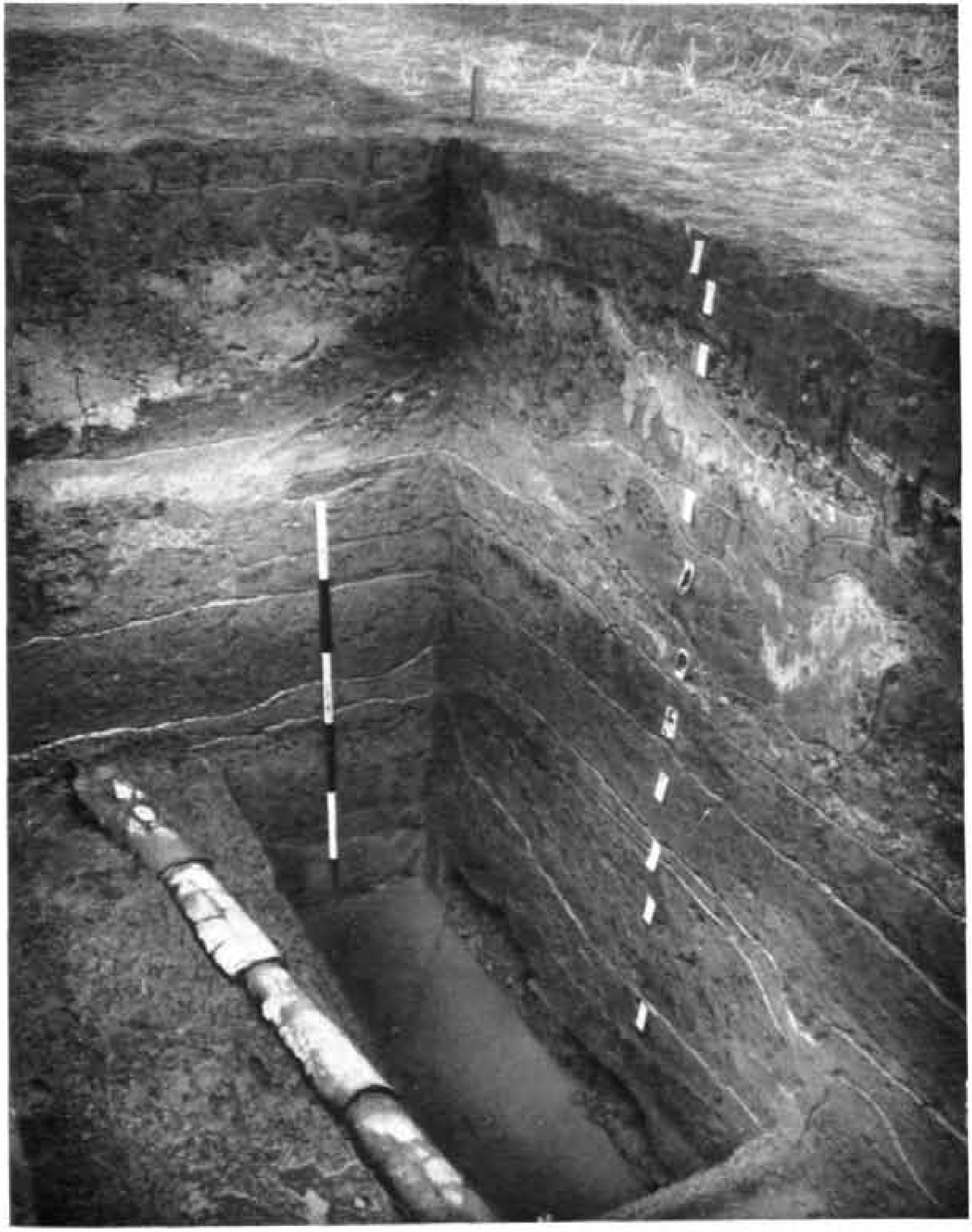


B

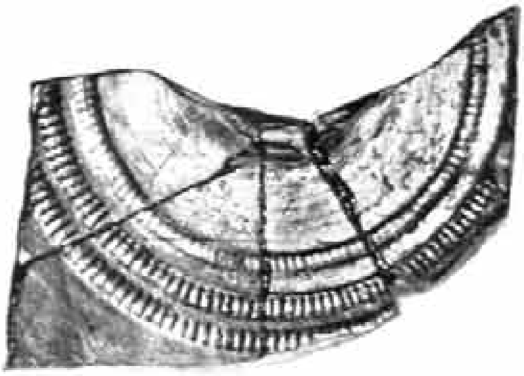


A

Rajghat (Varanasi): terracotta figurines. *See page 51*



Chandraketugarh : trench with pottery drain-pipes, Period II (scale of feet). *See page 51*



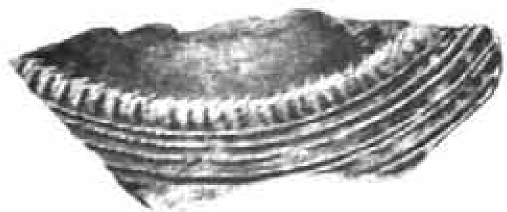
1



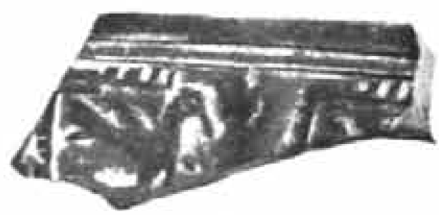
2



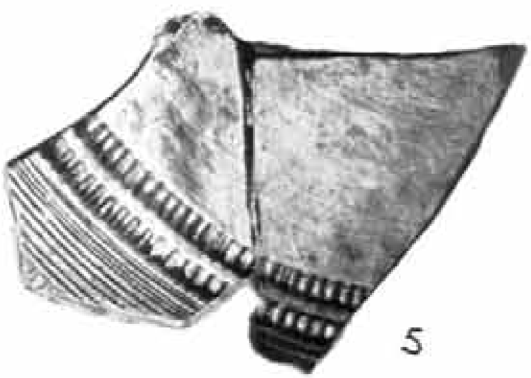
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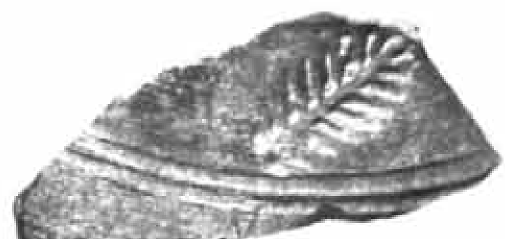
3



6



5



7

Chandraketugrah : rouletted and stamped pottery (approximately ½). *See pages 51 and 52*



A



B



C

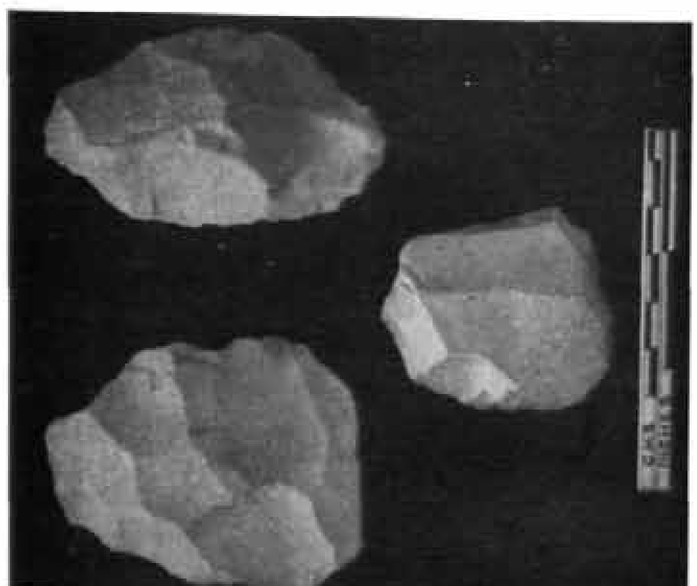
Chandraketugarh; A, *terracotta naga figurine;* B *and* C, *terracotta mithuna plaques.* *See pages 51 and 52*



A. *Nandalur : palaeoliths.* See page 64



B. *Nandalur : palaeoliths.* See page 64



C. *Nandalur : palaeoliths.* See page 64



D. *Siddhavattam: palaeolith.* See page 64



A



B

Pitalkhora : A, *sculptured frieze beside steps of chaitya-hall;* B, *sculptures near vihara-entrance.*
See page 65



A



B

Pitalkhora : A, entrance to the *newly-cleared vihara*; B, stone *dvara-pala in front of chaitya-hall.* *See page 65*



Pitalkhora: stone yaksha, front, side and back views (scale of foot-and-inches). *See page 65*



A



B

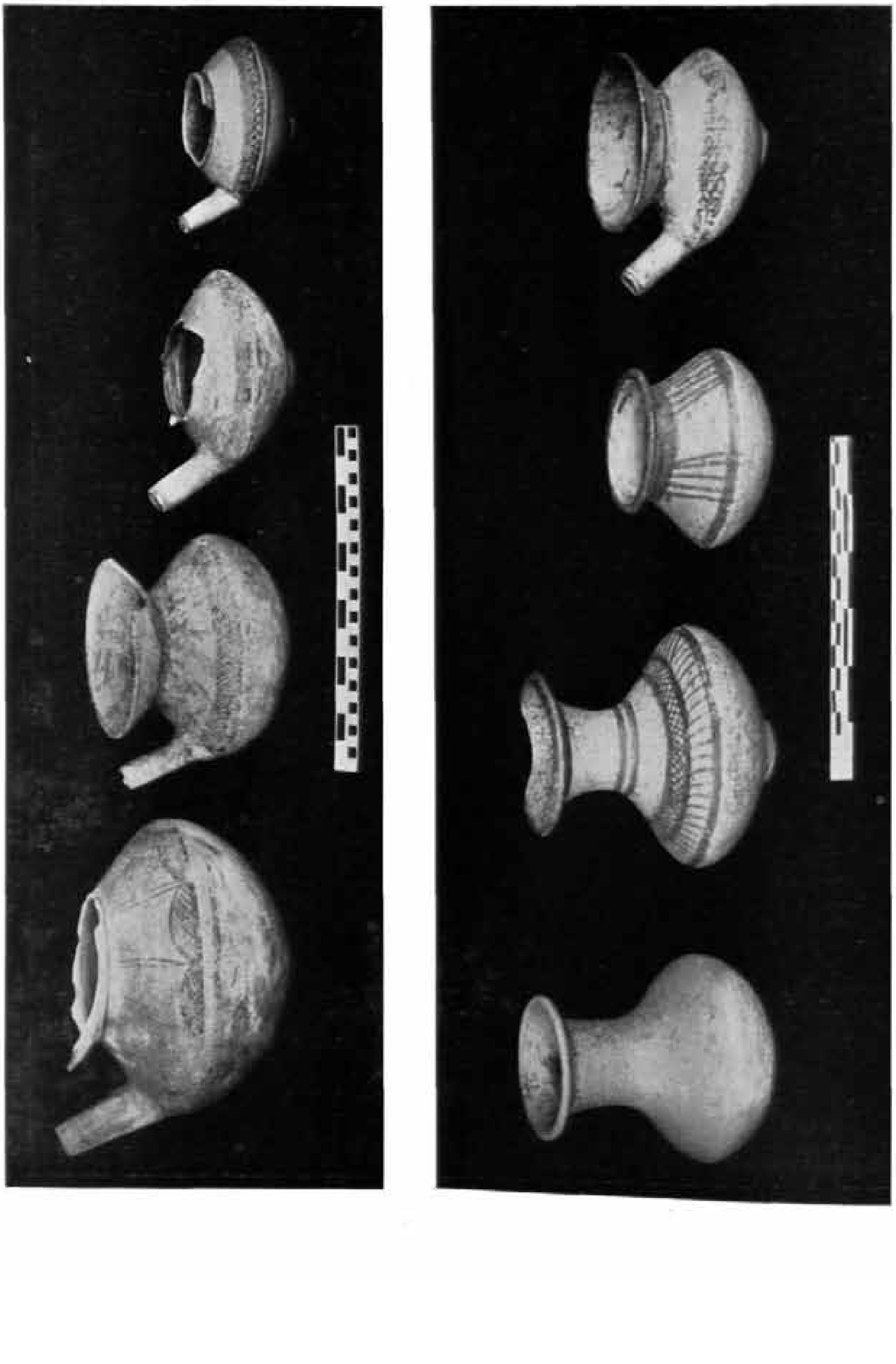


C

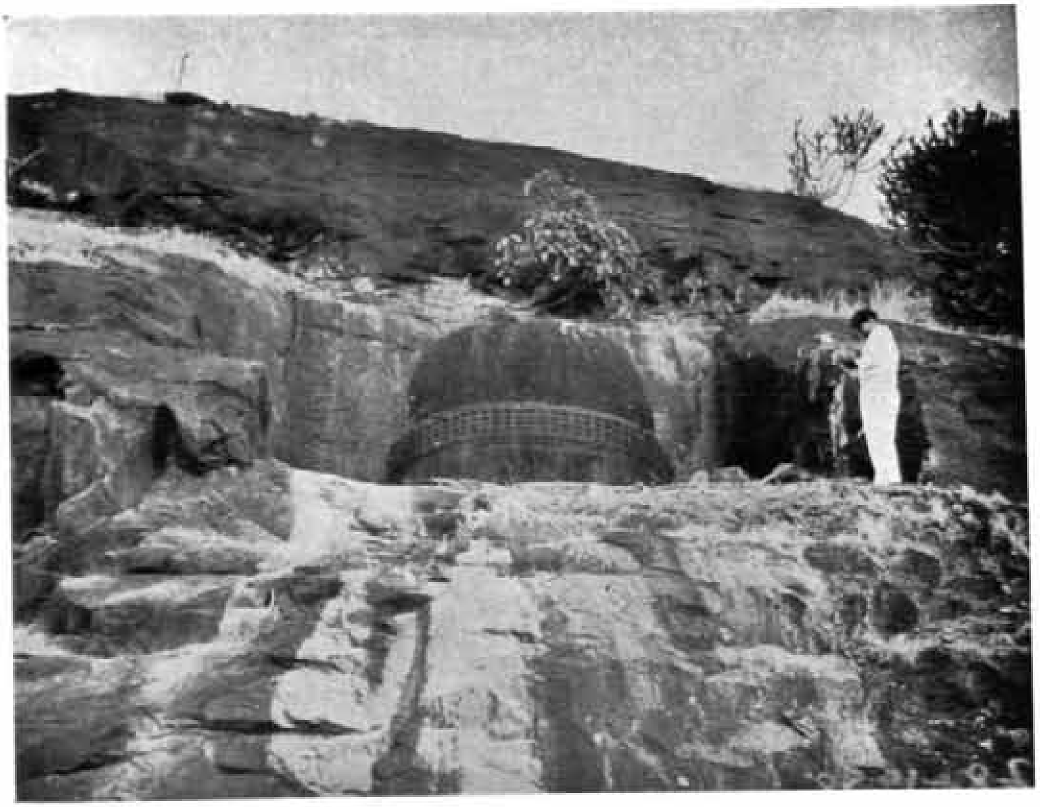
Pitalkhora : A, *pilaster with mithunas* (*scale of foot-and-inches*) ; B, *dvara-palika* ; C, *miniature crystal reliquaries and crystal bead with stopper*. *See page 66*



Pitalkhora : stone sculpture. See page 65



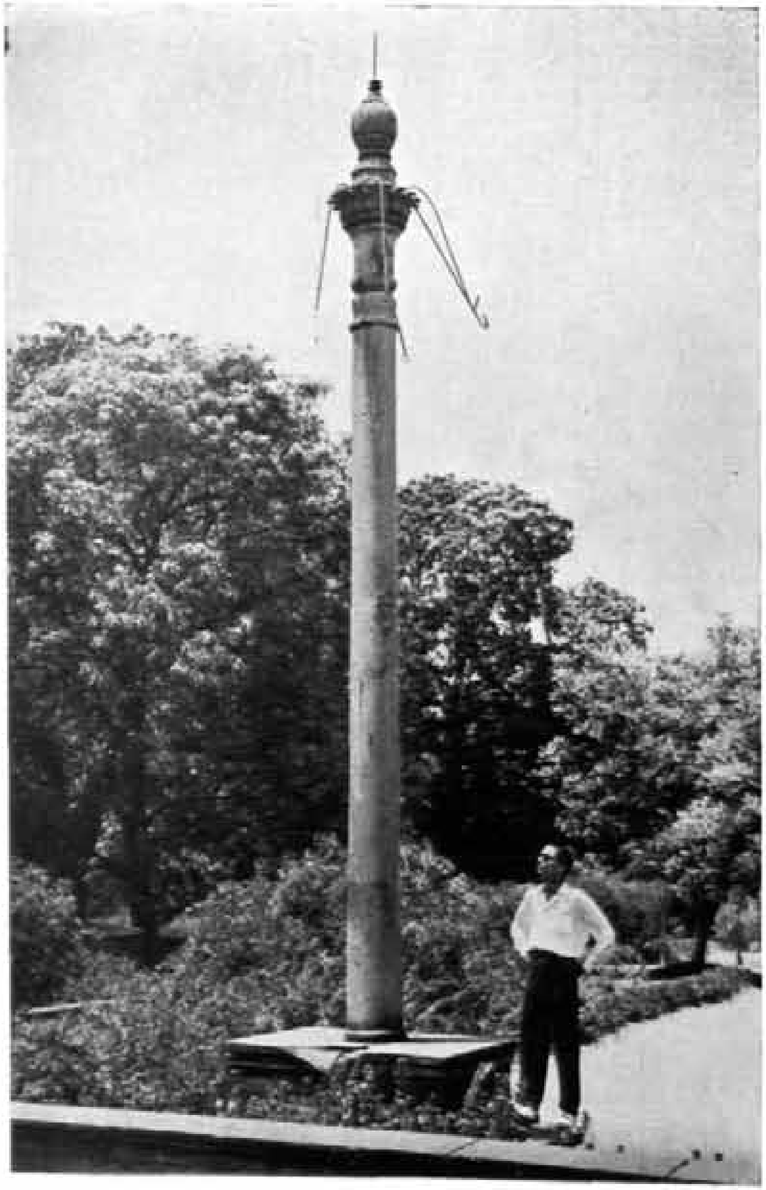
Pimpaldar : chalcolithic pottery. See page 66



A. *Induri : ruined chaitya-hall.* See page 67



B. *Fatehpur Sikri : sandstone Buddha head.* See page 69

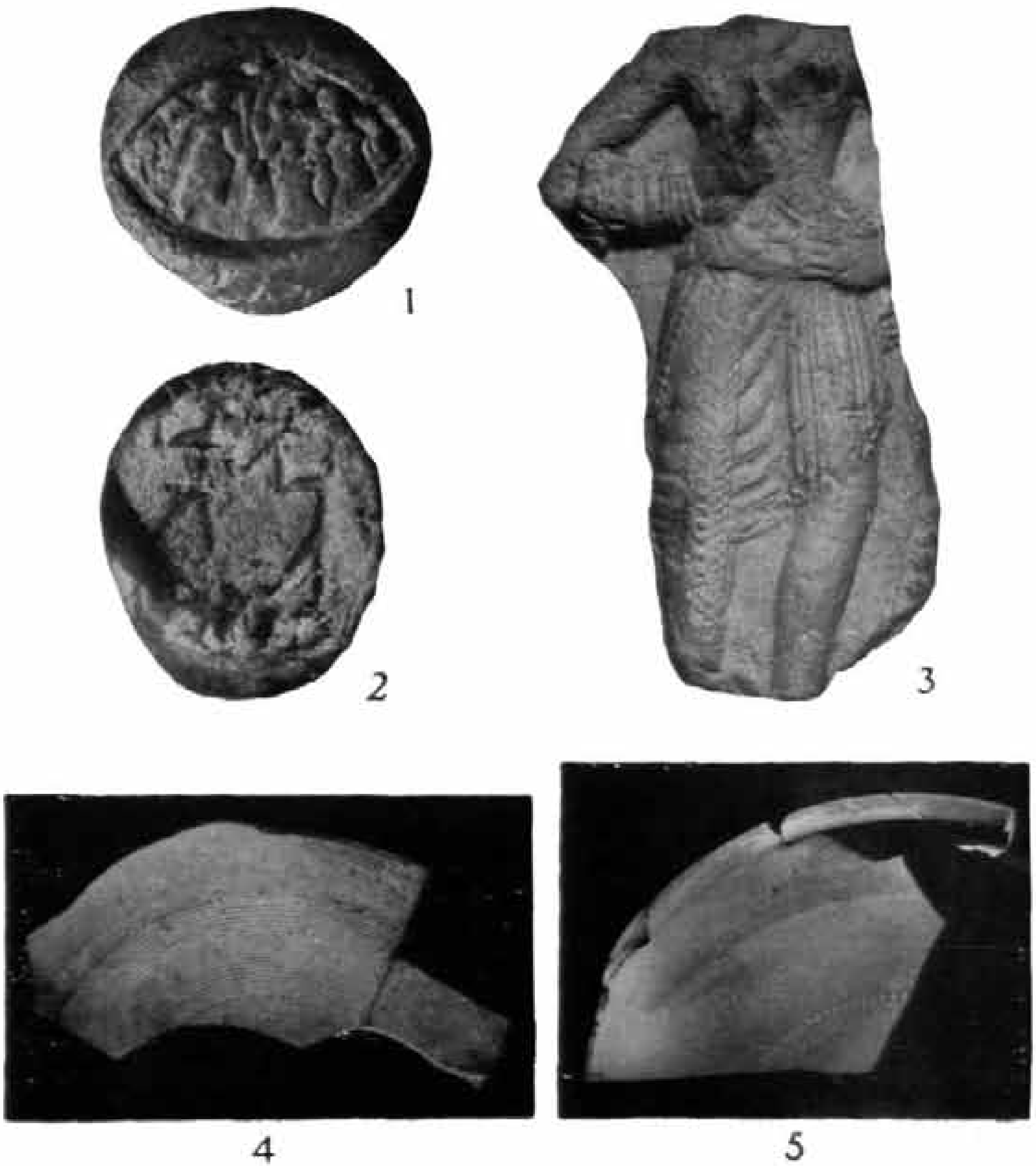


A

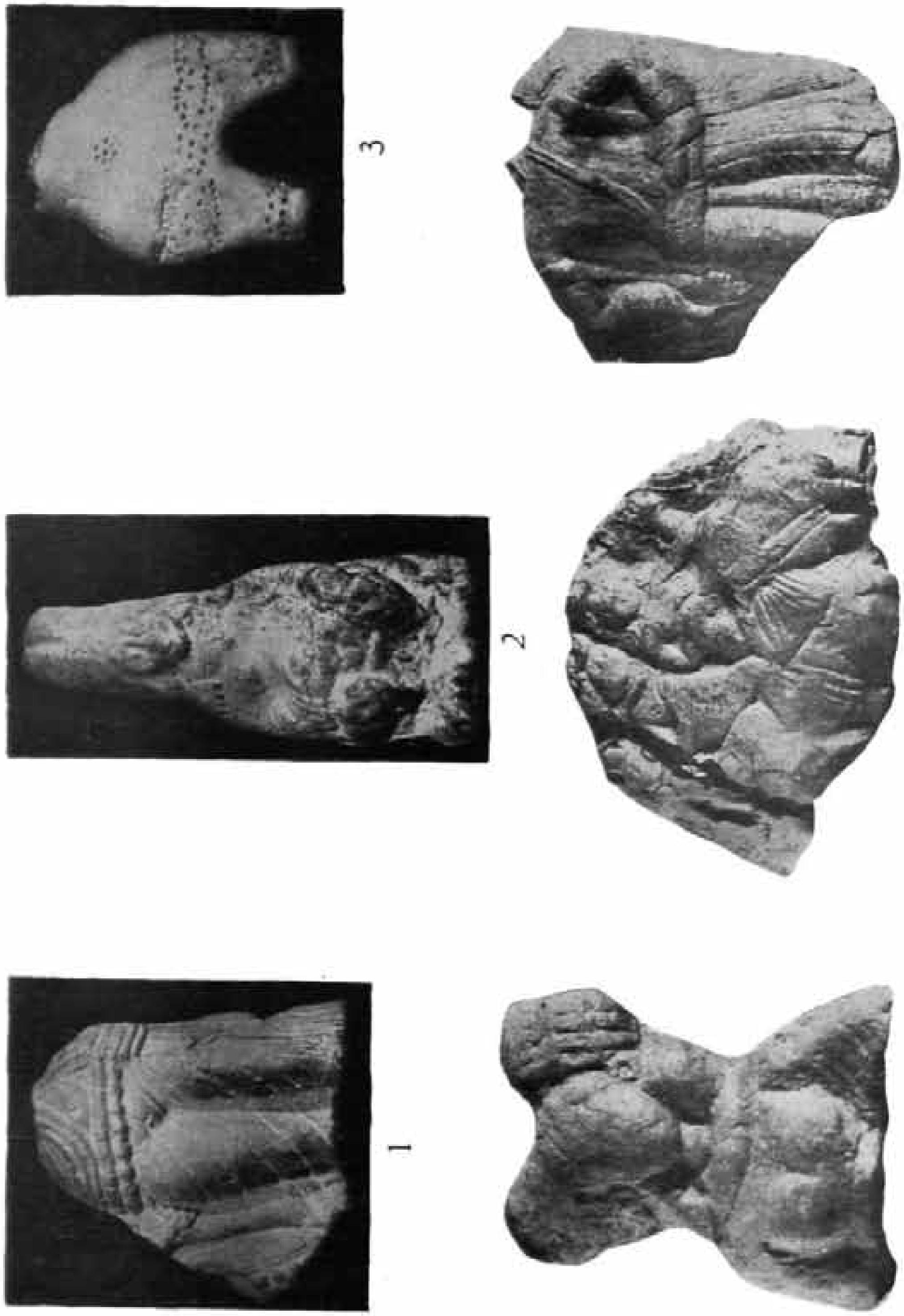


B

Bhopal : sandstone pillar with shell-inscription. *See page 68*



Chandraketugarh : 1, terracotta seal (ht. 1 in.). Harinarayanpur : 2, terracotta seal (ht. $\frac{9}{10}$ in.). Atghara : 3, terracotta figurine (ht. 6 in.) ; 4 and 5, Rouletted Ware ($\frac{2}{5}$ and $\frac{1}{2}$). *See page 70*



Harinarayanpur : 1-3, *terracotta figurines* (*hts.* $3\frac{7}{10}$, 4 *and* $3\frac{1}{5}$ *in. respectively*). *Chandraketugarh* : 4-6, *terracotta figurines* (*hts.* 3, $2\frac{4}{5}$ *and* 5 *in. respectively*). *See page* 70



A



B



C



D

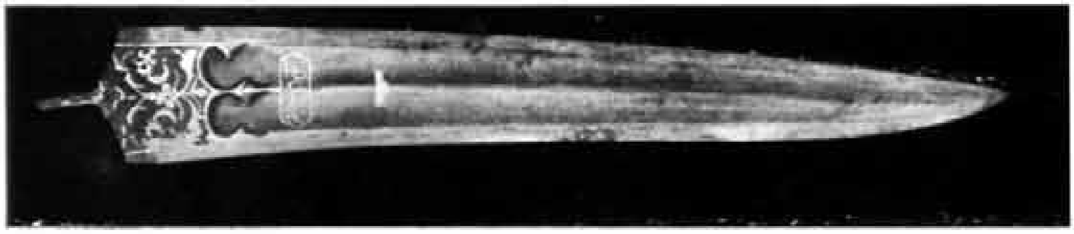
Allahabad Museum : terracotta figurines. *See page 71*



A



B



C

Prince of Wales Museum : A *and* B, *stone Kshetrapala (ht. 3 ft. 2 in.) and Surya (ht. 4 ft. 2 in.), north Gujarat. National Museum, New Delhi* : C, *inscribed steel dagger of Aurangzeb (length 10 in.).* *See pages 72 and 75*



A



B



C

Asutosh Museum, Calcutta: A, *sandstone Buddha (ht. $3\frac{1}{5}$ in.), Chandraketugarh;* B, *terracotta plaque with Buddha (ht. $7\frac{1}{8}$ in.), Panna. Patna Museum:* C, *bronze Siva (ht. 4 in.), findspot unknown.*
See pages 72 and 75



A



B

Asutosh Museum, Calcutta : A, *stone Vamana (ht. 1 ft. 3 in.), Tapan* ; B, *royal figure as devotee (ht. 5 ft. 7 in.), Contai.*
See page 72



A

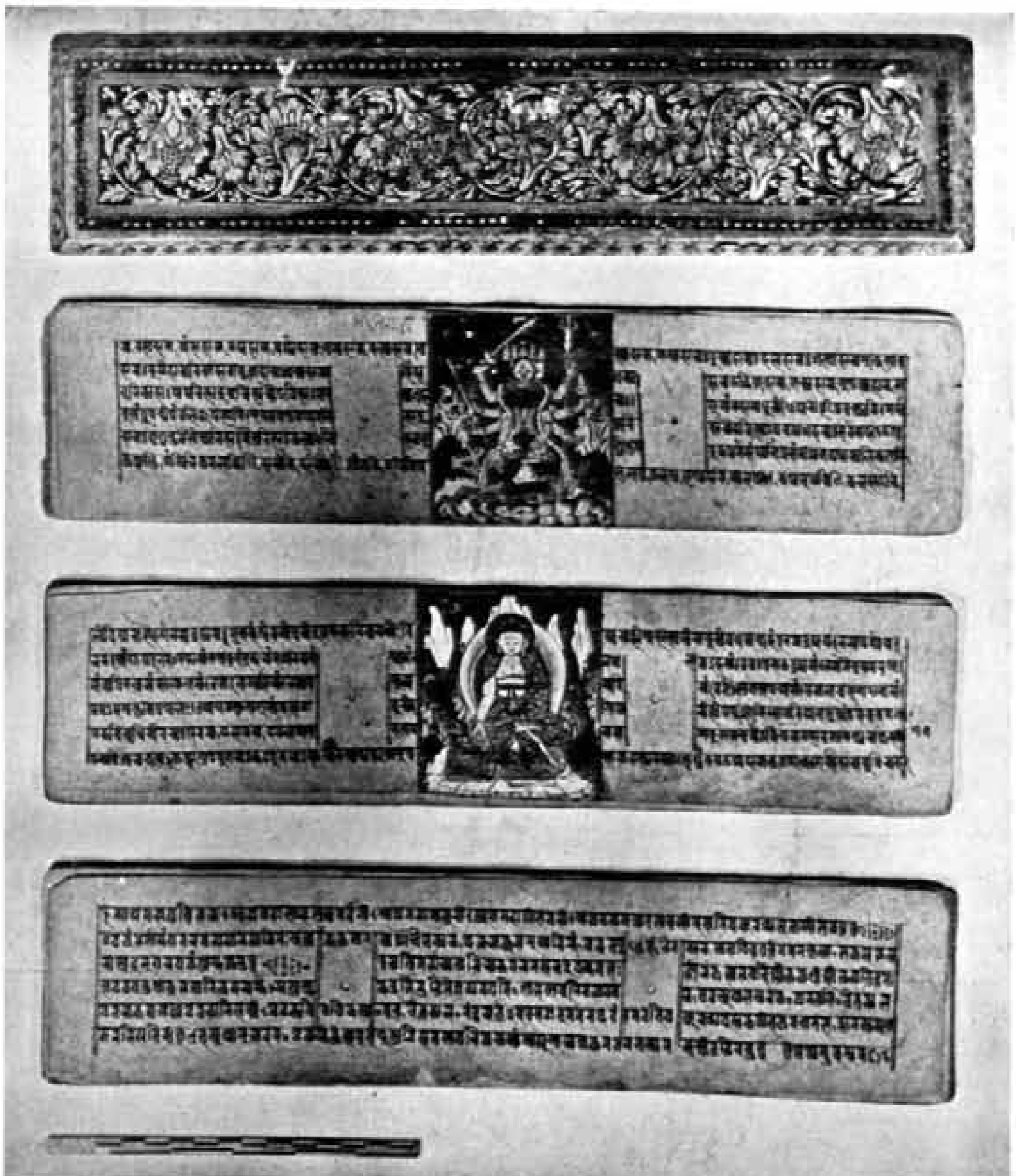


B



C

Indian Museum, Calcutta: A, *stone Vishnu (ht. 2 ft.), Navagram;* B, *Harihara-pitamaha (ht. 1 ft. 8 in.), Navagram;* C, *stone inscription (length 3 ft. 5 in.), Kalna.* *See pages 72 and 73*



Indian Museum, Calcutta: palm-leaf manuscript, Nepal. *See page 73*



A



B



C

Indian Museum, Calcutta : A, stone Buddha (ht. 1 ft. 2 in.), Barrackpore; B, wooden Manjusri (ht. 10 in.), Nepal. National Museum, New Delhi : C, stone Buddha (ht. 10¾ in.), findspot unknown. *See pages 72, 73 and 75*



A

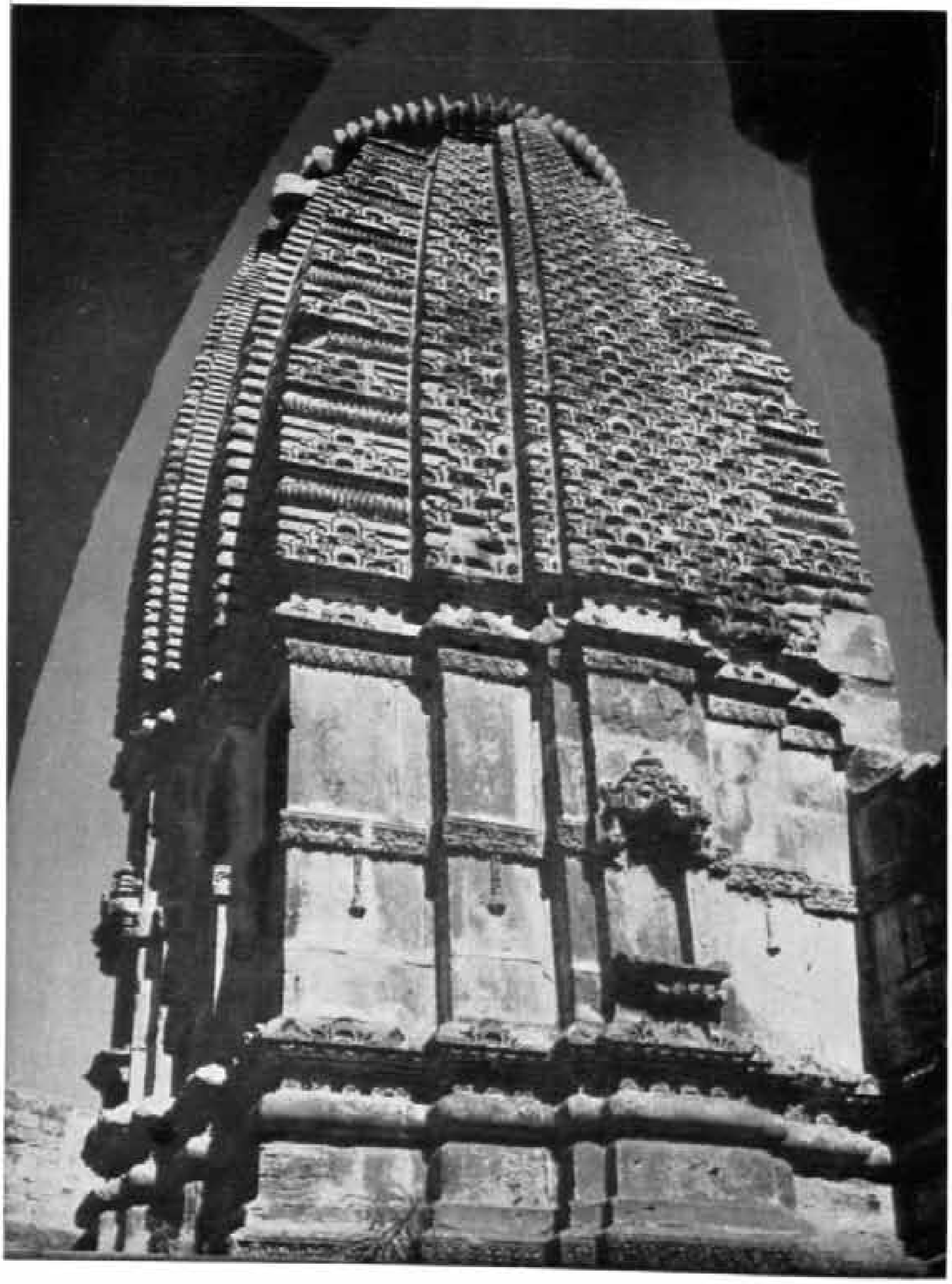


B

National Museum, New Delhi : A, illustration from Shah-nama (length 6½ in.); B, Kangra painting (length 1 ft.). See page 75



Patna Museum : sandstone bull-capital, Lohanipur (Patna). See paga 75



Wadhwan : Ranakdevi temple. *See page 77*



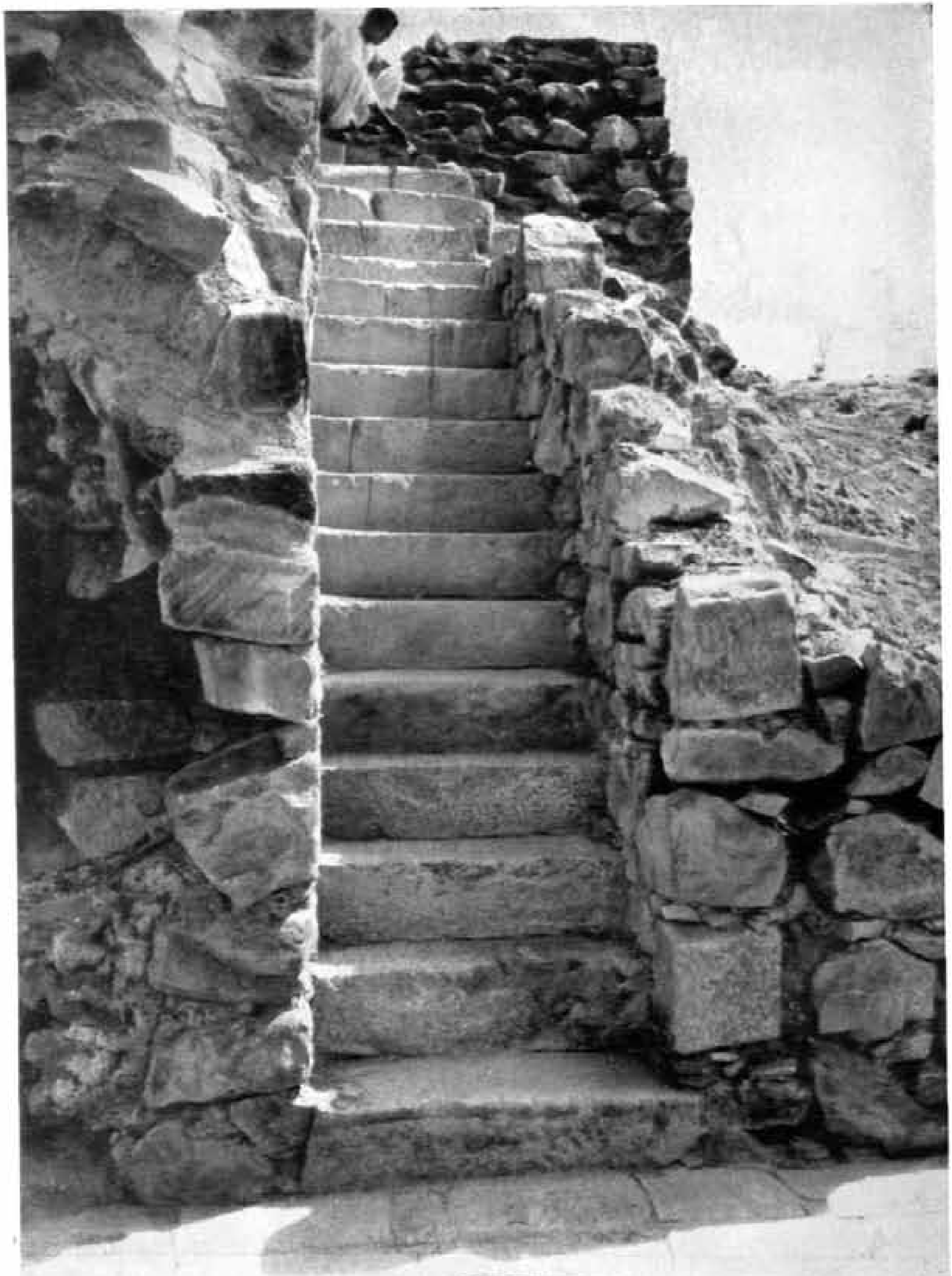
Modhera : Sun temple, southern façade of sabha-mandapa. *See page 77*



Kanchipuram : Piravatanesvara temple. See page 78



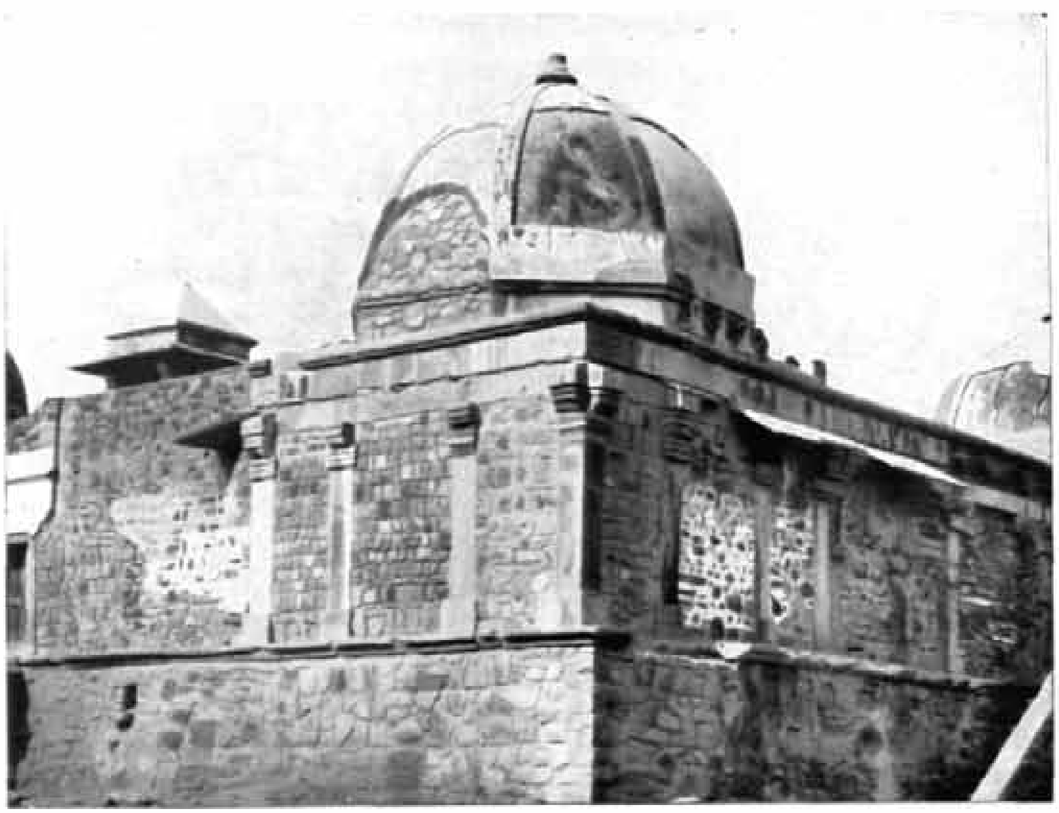
Tirupparur : Kailasanatha temple. *See page 78*



Delhi : Hauz-khas, flight of steps discovered during clearance. *See page 79*



A



B

Delhi: Qadam-sharif, south-west corner, before and after repairs. *See page 79*

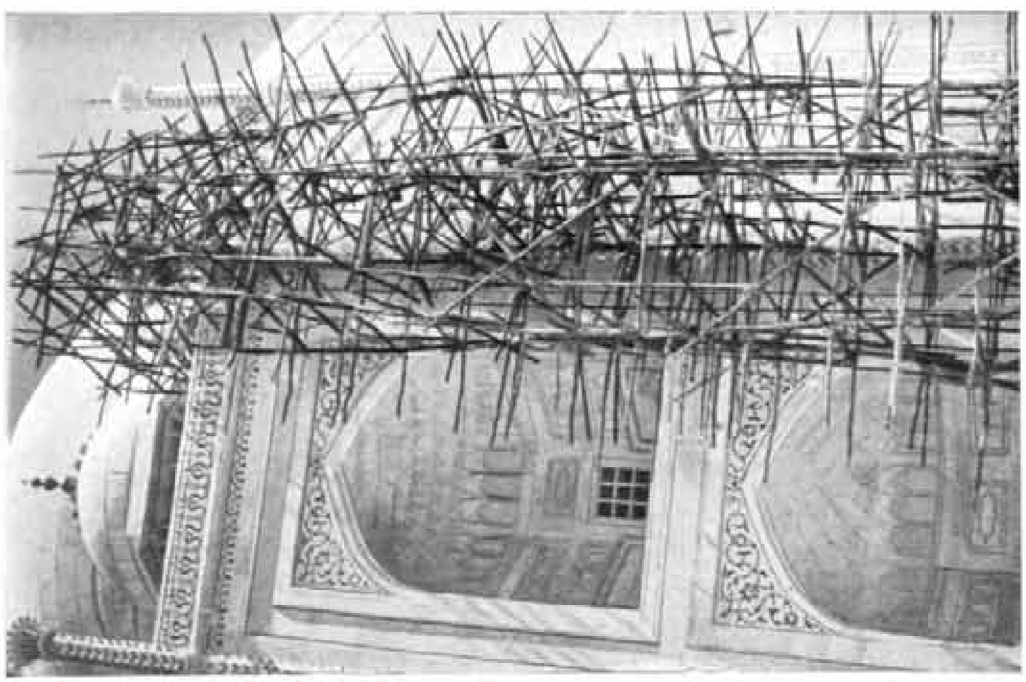


A

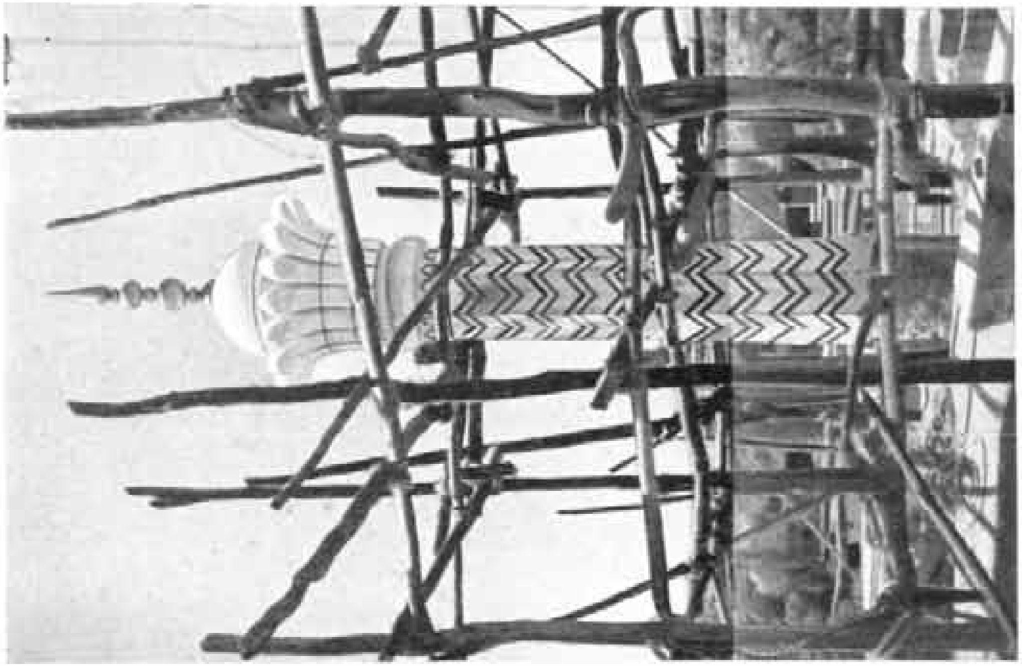


B

Delhi : tomb of ʿAbdur Rahim Khan-i-Khanan, before and during repairs. *See page 80*



A



B

Agra : Taj Mahal, A, *south-west pilaster, during repairs, and* B, *guldasta on pilaster, during repairs.* *See page 83*



Agra : Taj Mahal, north-west corner, with foundation resting on wells. *See page 83*



A



B

Joysagar : Ghanasyam's house, before and after repairs. See page 87



A



B

Udaipur : Chaturdasa-devata temple, before and after repairs. *See page 88*



A



B

Bangalore *: compound-wall of old dungeon, before and after repairs.* *See page 94*



A

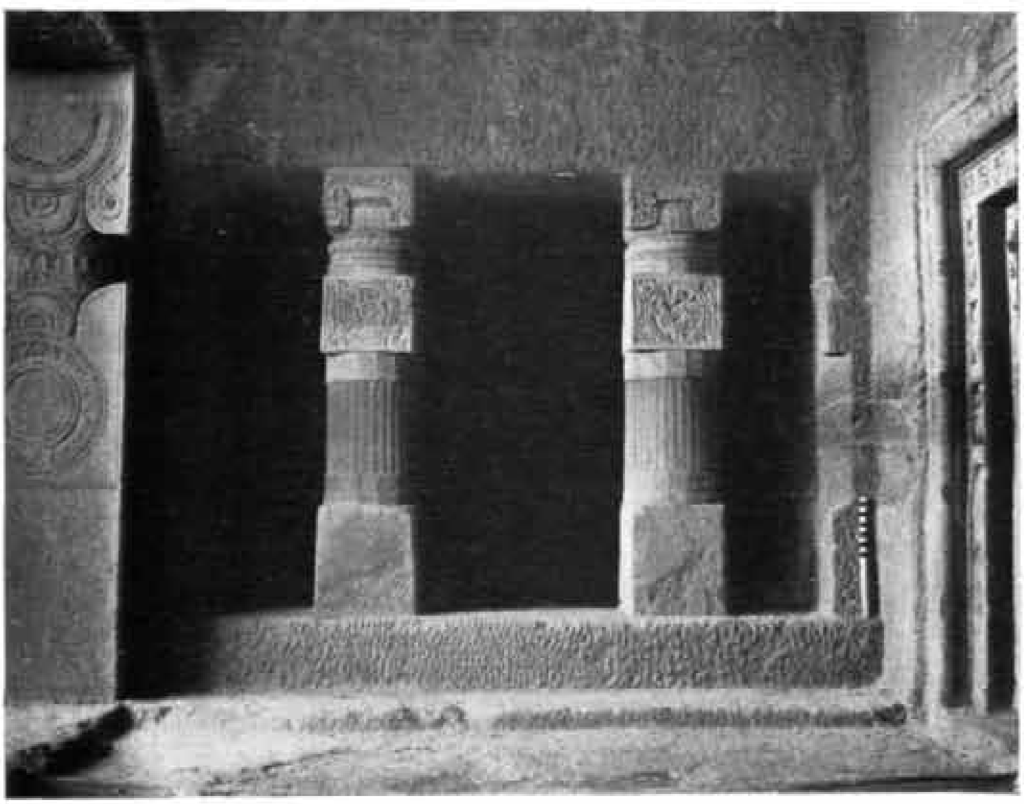


B

Ajanta: Cave 24, A, left verandah-wall during repairs. B, right verandah-wall after repairs. *See page 96*

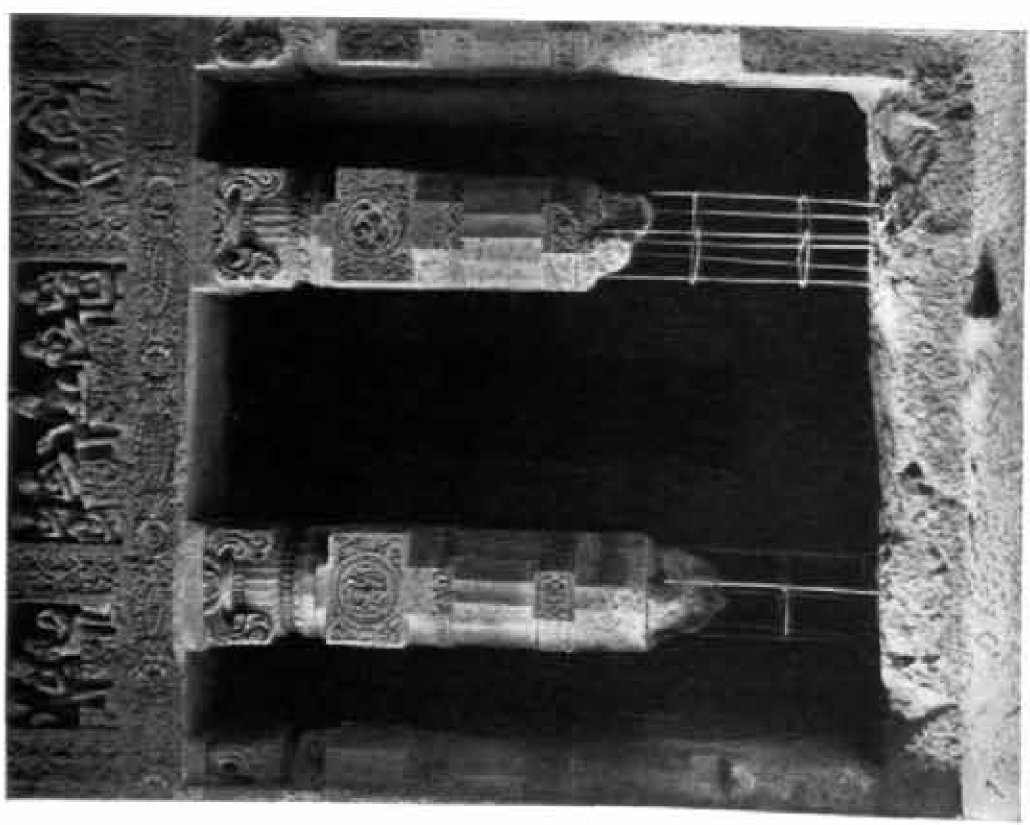


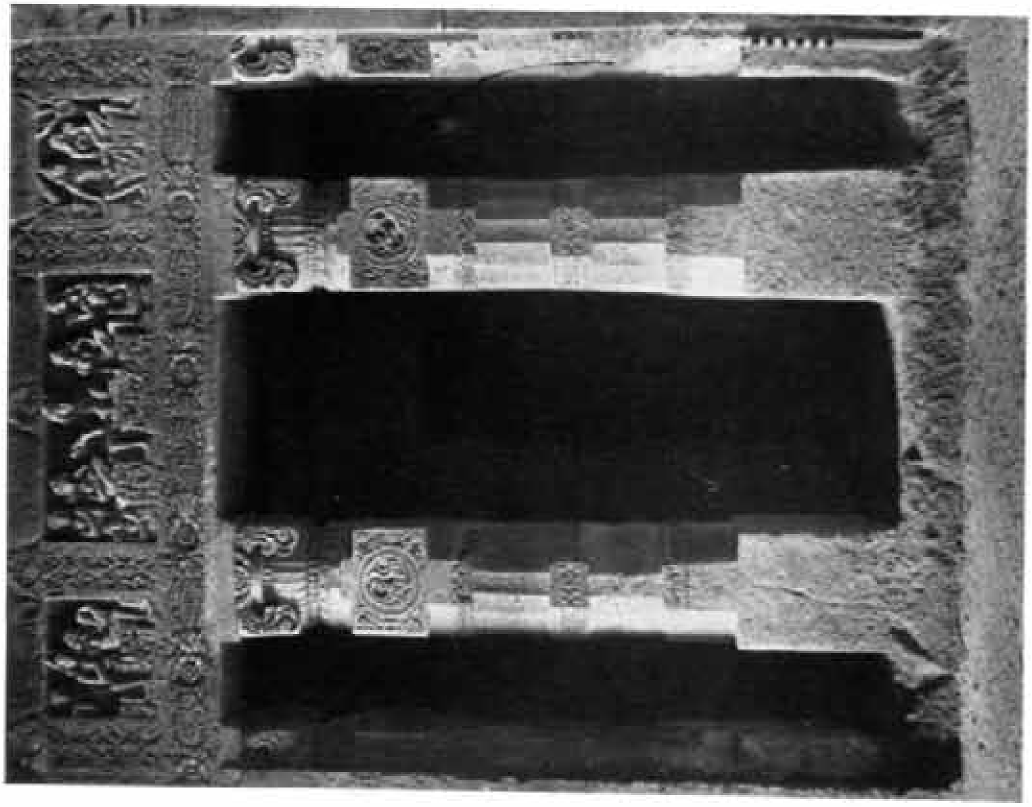
A



B

Ajanta: Cave 24, pillars of left cell, during and after repairs. *See page 96*





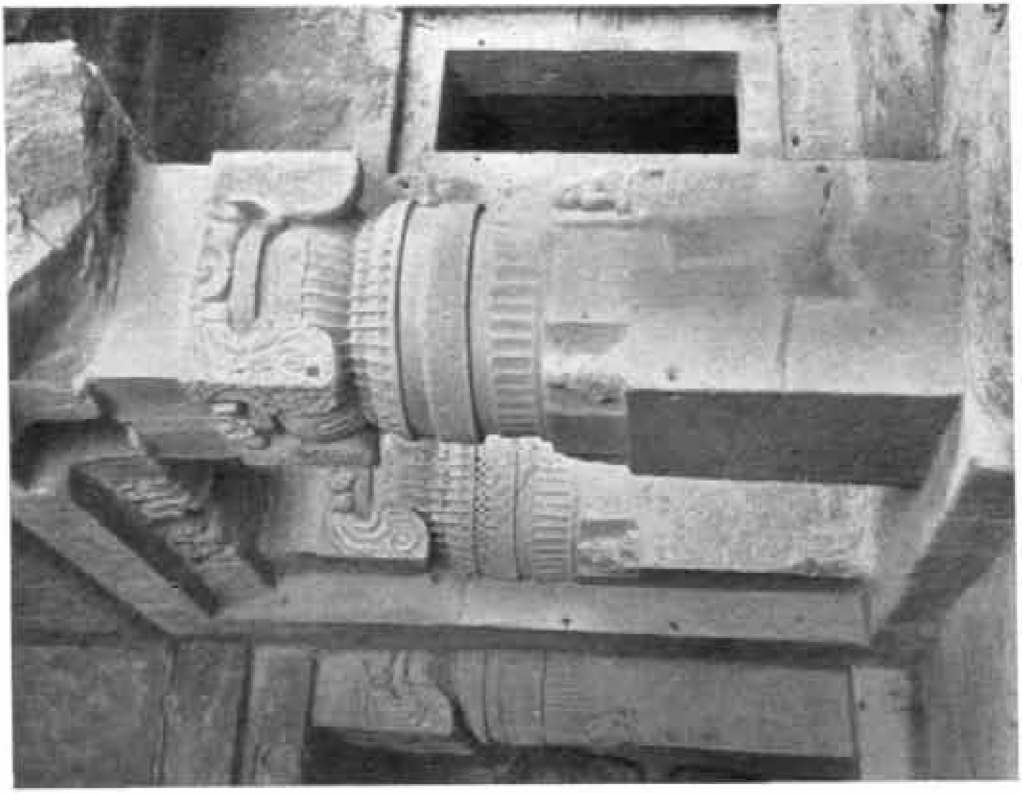
A

B

Ajanta : Cave 21, pillars of chapel in left corridor, during and after repairs. *See page 96*

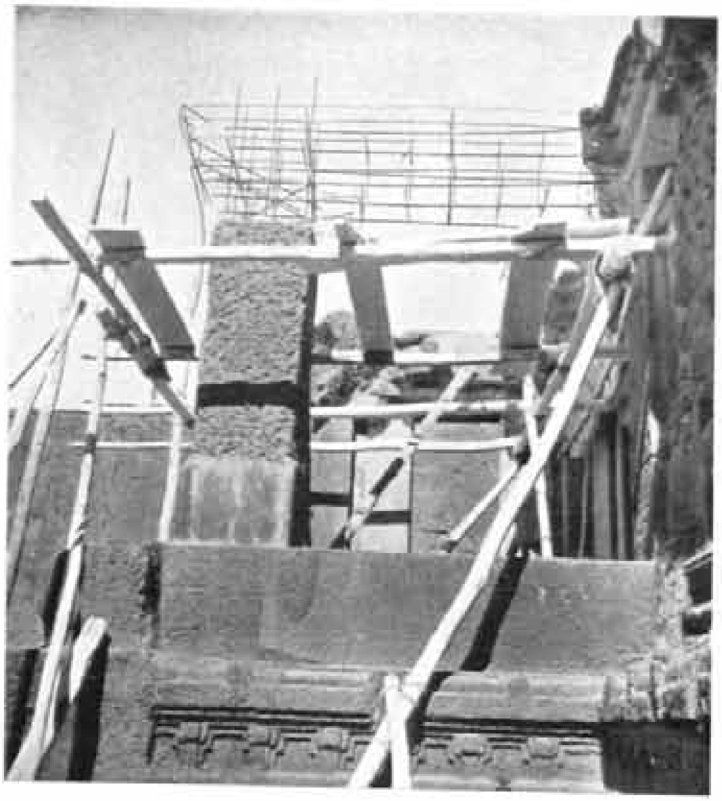


A



B

Ellora : Cave 6, front pillars, during and after repairs. *See page 97*



A



B

Ellora : Cave 15, porch in front of mandapa, during and after repairs. See page 97



A



B

Chitorgarh : Tower of Victory, plinth, during and after repairs. *See page 101*

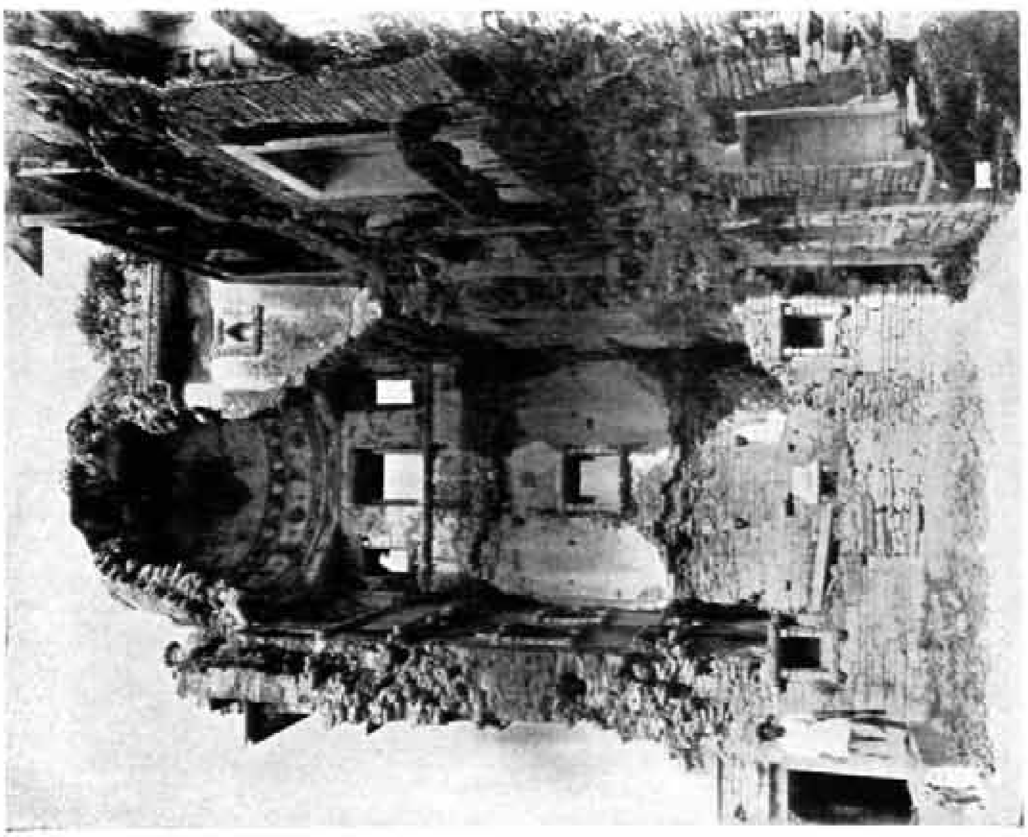


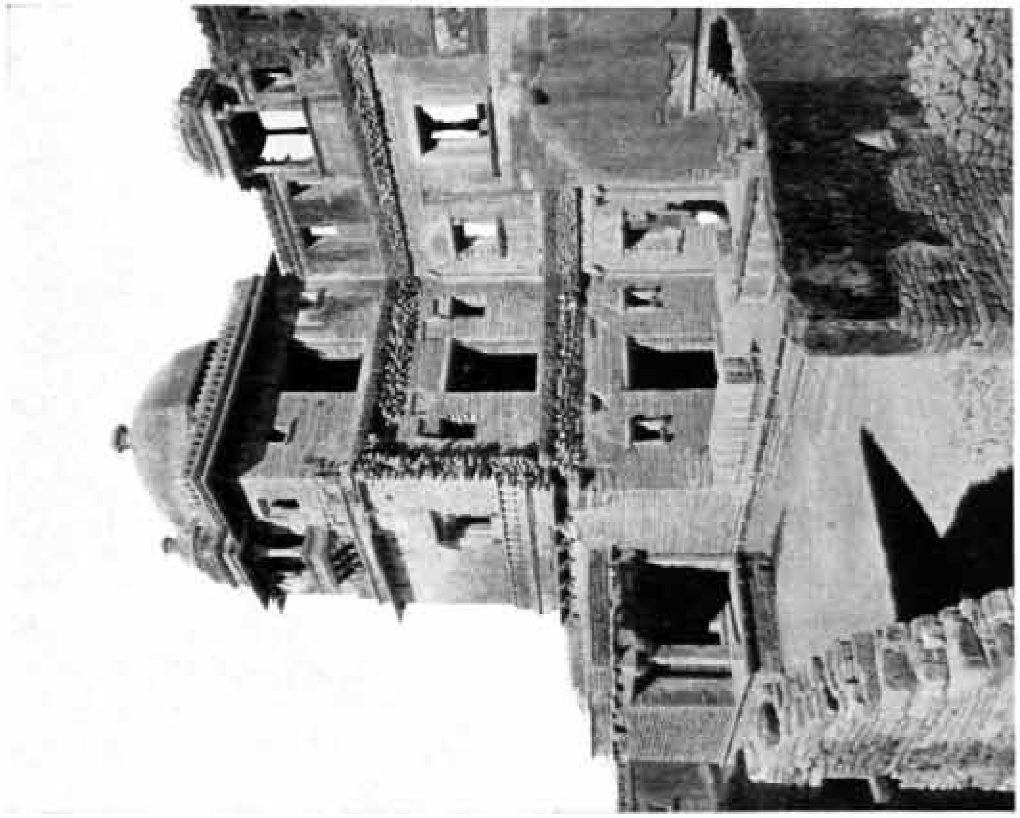
A



B

Chitorgarh : Siva temple in Sati-enclosure, before and after repairs. See page 101





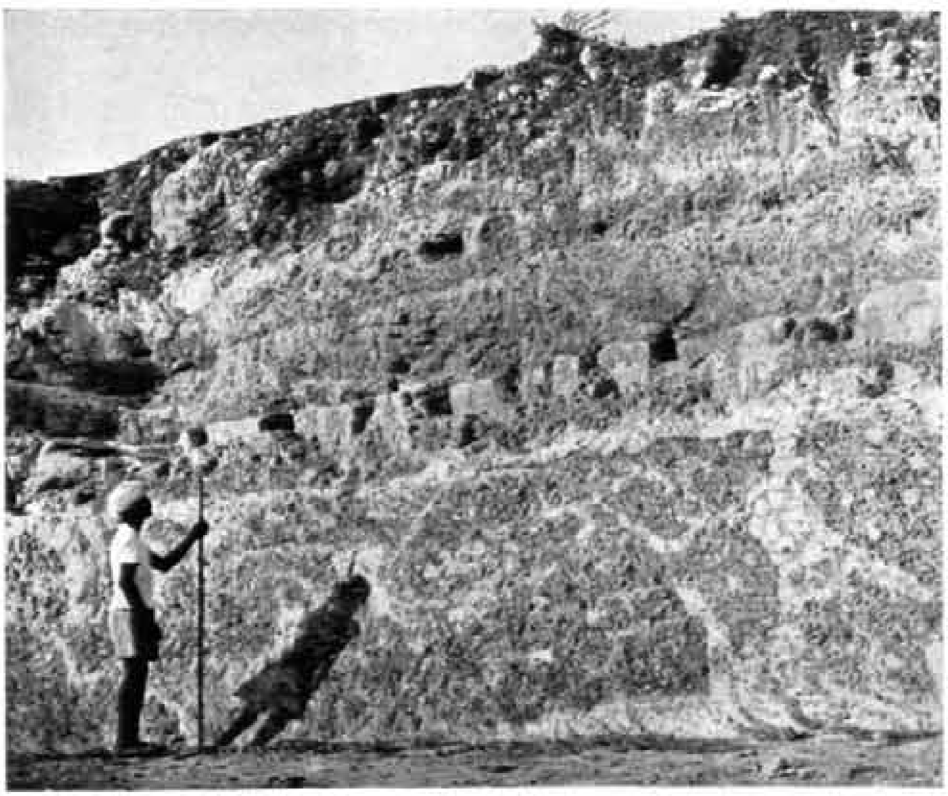
Chitorgarh : part of Rana Kumbha's palace-complex, before and after repairs. *See page 101*



Bagh : façade of ruined cave, discovered during clearance. See page 103



A



B

Bagh : A, *rock-strata over caves (the top soft claystone marked A)*; B, *roof of caves, claystone partly removed.* *See page 103*



Ajanta : painting during treatment in Cave 17. See page 108



Ajanta : painting during treament in Cave 17. See page 108



Ajanta : painting during treatment in Cave 17. *See page 108*



A. *Agra : 'Itimadu'd-Daulah, painting during treatment.* *See page 110*



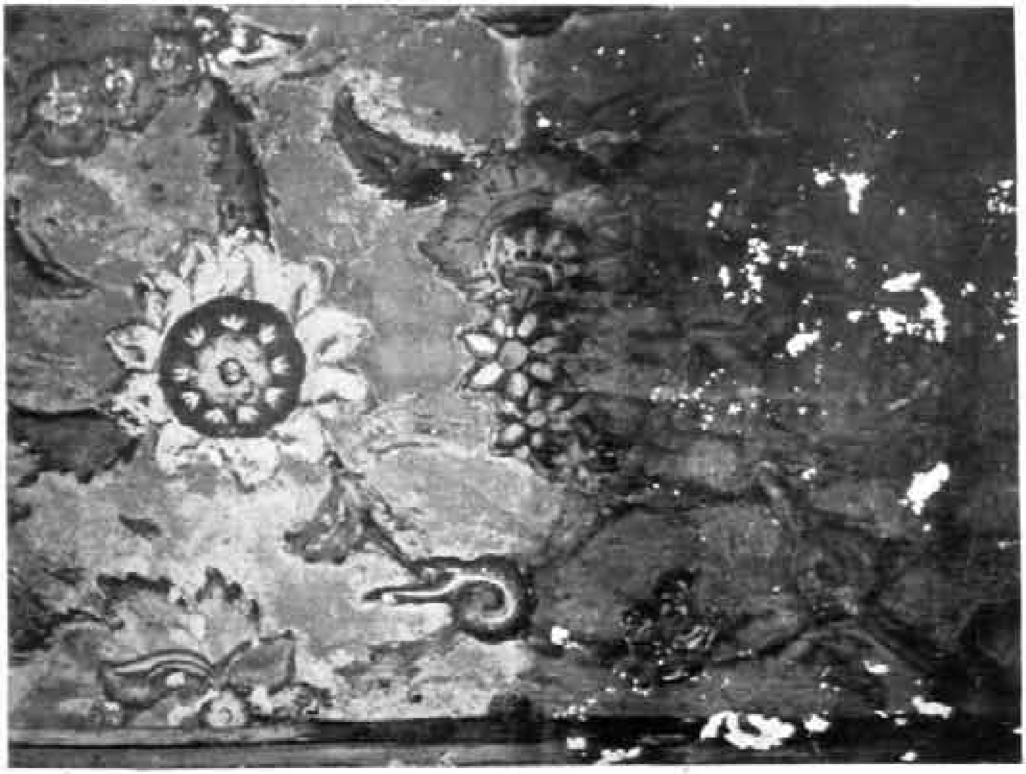
B. *Allahabad : Khusro-bagh, painting during treatment.* *See page 110*



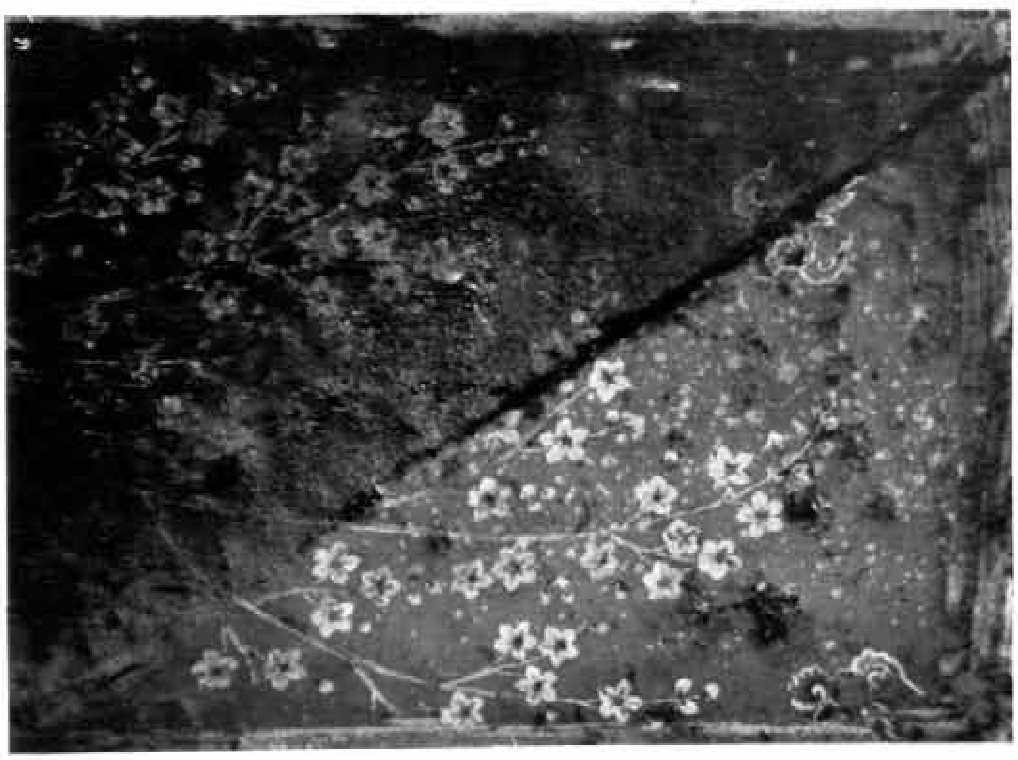
B. *Talbehat : Narasimha temple, painting during treatment.*
See page 111



A. *Sikandara : Sunehri-mahal, painting during treatment.*
See page 110



A. *Sikandara : painting during treatment.* See page 110



B. *Fatehpur Sikri : painting during treatment.* See page 110



A



B

Central Asian Antiquities Museum, New Delhi : Tibetan silk banner, before and after treatment (ht. 3ft. 1½ in.). See page 111